

HANDBOOK  
FOR  
SECONDARY SCHOOLS

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# HANDBOOK

FOR

# Secondary Schools

ALBERTA

CONTAINING  
DETAILS OF THE COURSES  
AUTHORIZED FOR SECONDARY SCHOOLS  
BY THE  
DEPARTMENT OF EDUCATION



AUTHORIZED BY THE DEPARTMENT OF EDUCATION

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1930

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# CURRICULA—ALBERTA HIGH SCHOOLS

## FIRST YEAR

Normal Entrance	Matriculation	Agricultural	Commercial	Technical	General
English { Literature 1 Composition 1 General Science 1 Algebra 1 Geometry 1 or Art 1 History 1  (6 units)	Matriculation requirements vary as between the Faculties and in accordance with the University course to be pursued. All interested are urged to secure copies of the current Matriculation Bulletin from the Registrar of the University.	English (2 units) General Science Algebra Geometry  (5 units)	Spelling and Penmanship Business English Literature Arithmetic and Rapid Calculation Bookkeeping Stenography Typewriting  Physical Education	English (2 units) General Science 1 General Mathematics 1 Drawing and Design 1  (5 units)	This is designed to give the student the widest choice in making up his programme.  Physical Education and two years of English are the only required subjects. At least six of the twenty-one units must be chosen from the subjects of the Third and Fourth Years. The remaining eleven units may be chosen as desired.
Physical Education  In schools where the languages are taught one of the following should be taken:  Latin 1 French 1 German 1 Greek 1	Physical Education  In schools where the languages are taught one of the following should be taken:  Latin 1 French 1 German 1 Greek 1	Physical Education  And one of the following: Latin 1 French 1 German 1 Greek 1 History 1 Manual Training 1 Household Economics 1 Music 1	Physical Education	Physical Education  And two units of shopwork chosen from the following: Woodwork 1 Metal 1 Electricity 1 Motor Mechanics 1 Household Economics 1 Sewing and Elementary Dressmaking 1	

Students who propose to enter the Faculty of Arts of the University of Alberta are now required to secure matriculation in but one foreign language.

Subject to certain limitations, Geography 1 and Art 1 will be accepted for Matriculation credit by the University of Alberta.

# CURRICULA—ALBERTA HIGH SCHOOLS

## SECOND YEAR

Normal Entrance	Matriculation	Agricultural	Commercial	Technical	General
English { Literature 2 Composition 2 Art 1 or Geometry 1 History 2 Agriculture 1 or Physics 1 *Geography 1  (6 units)	Matriculation requirements vary as between the Faculties and in accordance with the University course to be pursued. All interested are urged to secure copies of current Matriculation Bulletin from the Registrar of the University.	English (2 units) History Physics Agriculture  (5 units)	Spelling and Word Study Penmanship and Rapid Calculation Business English and Office Practice Literature Stenography Typewriting	English { Literature 2 Composition 2 Industrial History General Mathematics 2 General Science 2 Drawing and Design 2  (6 units)	
Physical Education	Physical Education	Physical Education	Physical Education	Physical Education	Physical Education
And one of the following:  Physics or Agriculture Algebra Geometry Latin Greek French German Manual Training Household Economics Music	And two of the following:  Art Algebra Geometry Latin Greek French German Manual Training Household Economics Music	And one of the following:  History 3 Bookkeeping	And one unit of shopwork to be chosen from:  Carpentry 1 Cabinet work 1 Metal 2 Electricity 2 Motor Mechanics 2 Household Economics 2 Dressmaking 2	This is designed to give the student the widest choice in making up his programme.  Physical Education and two years of English are the only required subjects. At least six of the twenty-one units must be chosen from the subjects of the Third and Fourth Years. The remaining eleven units may be chosen as desired.	

Students who propose to enter the Faculty of Arts of the University of Alberta are now required to secure matriculation in but one foreign language.

\*Where the school organization permits, Geography should be selected in the second year. If Geography is not selected two options are required. Art 1 and Geometry 1 are compulsory for Normal entrance. Students who elect Art 1 in First Year should elect Geometry 1 in the Second Year. Subject to certain limitations, Geography 1 and Art 1 will be accepted for Matriculation credit by the University of Alberta.

# CURRICULA—ALBERTA HIGH SCHOOLS

## THIRD YEAR

Normal Entrance	Matriculation	Agricultural	Commercial	Technical	General
English { Literature 3 History 3 Composition 3 Agriculture 2 or Chemistry 1 Arithmetic 1 *Geography 1  (6 units)	Matriculation requirements vary as between the Faculties and in accordance with the University course to be pursued. All interested are urged to secure copies of the current Matriculation Bulletin from the Registrar of the University.	English (2 units) History and Economics Chemistry Agriculture Arithmetic  (6 units)	Business English and Office Practice Literature Arithmetic and Rapid Calculation Commercial Law Commercial Geography Bookkeeping	Not yet complete	
Physical Education	Physical Education	Physical Education	Physical Education	Physical Education	Physical Education
And *two of the following: ‡Algebra ‡Art ‡Geometry ‡Chemistry or Agriculture ‡Latin ‡Greek ‡German ‡French ‡Music Manual Training Household Economics		And two of the following: Art Geography Algebra Geometry Latin French German Greek Music	And one of the following: History 3 Secretarial Training		This is designed to give the student the widest choice in making up his programme.  Physical Education and two years of English are the only required subjects. At least six of the twenty-one units must be chosen from the subjects of the Third and Fourth Years. The remaining eleven units may be chosen as desired.

\*If Geography was taken in the Second Year, a third option is required.

†The second units in these subjects may be chosen only in case they were not selected in the Second Year.

‡Art 1 is a pre-requisite to Art 2.  
Students who propose to enter the Faculty of Arts of the University of Alberta are now required to secure matriculation in but one foreign language.  
Subject to certain limitations, Geography 1 and Art 1 will be accepted for Matriculation credit by the University of Alberta.



# CURRICULA—ALBERTA HIGH SCHOOLS

## FOURTH YEAR

Normal Entrance (First Class)	Matriculation	Technical	General
<p>English { Literature 4 Composition 4</p> <p>(2 units)</p>	<p>Matriculation requirements vary as between the Faculties and in accordance with the University course to be pursued. All interested are urged to secure copies of the current Matriculation Bulletin from the Registrar of the University.</p>	<p>Not yet complete.</p>	<p>This is designed to give the student the widest choice in making up his programme. Physical Education and two years of English are the only required subjects. At least fourteen of the twenty-nine units must be chosen from the subjects of the Third and Fourth Years. The remaining eleven units may be chosen as desired.</p>
<p>Physical Education</p> <p>And six units to be chosen from the following:</p> <p>History 4, History of English Literature 1, Algebra 3, Geometry 3, Trigonometry 1, Physics 2, Biology 1, Chemistry 2, German 3, French 3, Latin 3, Greek 3, Music 3.</p>	<p>Physical Education</p> <p>To secure standing in the subjects of the First Year of the Faculty of Arts credit in the following Fourth Year units must be obtained:</p> <p>English Literature 4, Composition 4, Algebra 3, Geometry 3, Trigonometry, the third course of one language and three of History 4, Chemistry 2, Physics 2, Biology 1, French 3, Latin 3, German 3, Greek 3.</p>	<p>Physical Education</p>	

\*It is probable that during the year 1930 the Mathematics requirement for First Year standing may be reduced to **two** units. Announcement of any change will appear in the **Regulations**.



# GENERAL INTRODUCTION

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The problem of the organization of a programme of studies has become one of very greatly increased difficulty within the past few decades. With the rapid increase in our knowledge of natural phenomena, with the rapid development of the means for the dissemination of such knowledge, with the increasing differentiation in training now demanded by our complex industrial system, and with a growing recognition of the nature and extent of individual capacities and interests, the arranging of a programme of studies which will give due balance to all factors is a serious undertaking. This programme may not be a perfect expression of such knowledge as we now possess; but it is believed to provide a more adequate instrument for the attainment of the ends of secondary education than any we have had hitherto.

An attempt has been made to analyze the aims and functions of secondary education. They may be indicated briefly as follows:

1. To prepare the individual for efficient participation in the duties of social, civic, political, and family life. It must provide for the adjustment of the individual student to the social ideals and standards of his time, and at the same time prepare him to take a part in the modification of these as they cease to be effective. And although it must secure this social unity and solidarity, through the development of common ideals, habits, and standards, it yet must make provision for the expression of the great individual differences, innate or acquired, in pupils. The State, having assumed charge of education, must now discharge its function by providing for the well-being and evolution of all the society which it represents.

2. To prepare the student to become an efficient economic factor. Such preparation may be complete or partial; the school may aim, as in the case of certain commercial students, to prepare adequately for entrance into the economic world; at other times the secondary school aims merely to prepare the pupil for entrance to higher vocational institutions. Due recognition must be paid again both to the differentiated capacities of the pupils, and to the differentiated needs of society. It is the function of the school to diagnose efficiencies and deficiencies, to assist in the selection of those pupils who can profit by higher education, and to organize the type of education of each pupil so that he may be prepared to enter efficiently into that work which he can best do.

3. To prepare the student for the activities whose primary purposes are personal development and personal happiness, through the correct use of his leisure time. The secondary school can no longer deny that a part of its function is so to direct the education

of the child that he may choose, intelligently and wisely, from the rapidly increasing opportunities for enjoyment, those of most value to himself and his fellow-men.

If these aims are to be attained and these functions performed by the secondary school, it is imperative that greater flexibility be provided for in a new programme of studies. The programme will be seen to meet this need in several ways:

1. Six alternative courses are provided, viz.: Normal Entrance, Matriculation into the various courses given by the University, Agricultural, Commercial, Technical, and General. The only limitations as to what courses may be offered are those imposed by economic conditions.

2. Within each elective course there is an increasing number of optional subjects.

3. Certain obligatory subjects are common to all courses. This fact, together with the liberal proportion of options, will allow students to transfer from one course to another without being too heavily handicapped. There are two reasons for this arrangement. In the first place, it allows the pupil to postpone his choice of vocation until a later stage in his school career; and, secondly, it allows the pupil, who discovers that he has made an error in his vocational choice, to recast his course without too much loss of time.

4. Local authorities, with the sanction of the Department of Education, are allowed to offer optional courses in subjects of special local interest.

5. Considerable latitude is allowed local school authorities as to the sequence in which the various subjects are to be treated. Thus, while English must be taught in every year, school authorities are allowed to vary the time at which such courses as Algebra or Foreign Languages may be taken. Outlines of the course, which are set forth later, indicate which subjects are obligatory, and the total number of units to be taken in order to obtain a diploma; but local authorities will be able to take into consideration the qualifications and number of the teaching staff when arranging each year's programme.

6. Promotion is to be made by subjects; and in every case, the right to promotion is to be determined by success at Departmental examinations. Provincial examinations will be held every year in all subjects of the High School programme of studies. All applicants must be admitted to these examinations, whether they have been trained in the regular day schools or not.

7. High School diplomas will be awarded to all students who have completed the seventeen units of work specified as obligatory in any course, and four units of work from the optional courses, and who have taken Physical Education, Physiology and Hygiene as set forth in the Regulations.

The following twenty-one units are required for admission to Normal School as a candidate for a Second Class Certificate:

English { Literature 1 Composition 1	English { Literature 2 Composition 2	English { Literature 3 Composition 3
History 1	Art 1	History 3
Algebra 1	History 2	Arithmetic 1
Geometry 1	Either Physics 1	Geography 1
General Science 1	or Agriculture 1	Either Chemistry 1 or Agriculture 2

*Any four of:* Algebra 2, Geometry 2, Agriculture 1 *or* Physics 1, Agriculture 2 *or* Chemistry 1, Latin 1, Latin 2, French 1, French 2, German 1, German 2, Greek 1, Greek 2, Art 2, Music 1, Music 2, Manual Training 1, Manual Training 2, Household Economics 1, Household Economics 2.

In addition, Diplomas will be awarded as follows:

1. Those who have obtained High School Diplomas, and who have completed eight additional units of fourth year work, of which two units were English, will be granted a High School Graduation Diploma.
2. Those who have completed the one-year vocational course in commercial subjects will be granted a Certificate of Standing.

A "unit" may be defined as the amount of material the average pupil can prepare effectively in from 175 to 200 minutes per week during the school year. The content of each course, except English, has been prescribed on the assumption that it requires approximately this amount of time. The unit value to be allotted to each course in English is 2.

The distribution of units is indicated in the detailed outlines of courses.

The selection of subjects, the determination of contents of subjects, and the arrangement of the subjects into curricula, are also problems of the very gravest importance. With the exponents of each department of human knowledge clamoring for the inclusion of their subjects in the High School programme of studies, cause must be shown for the retention of any subject either as obligatory or as optional. In the introductory statements which precede the detailed contents of each subject of study will be found a statement of the values which modern educators are ascribing to that subject, and which have justified the inclusion of such material in this revised programme. It is not contended that these statements possess any great degree of finality, inasmuch as they are conditioned by the present state of our knowledge of psychology, sociology, physiology, and economics, all of which are in a state of transition. But for the period of time through which this course will be in operation they will probably remain pertinent.

Subjects may be retained because they possess direct or indirect values, or both. Some of the knowledge and skill developed in and through a subject of study may be directly applicable to the economic, social, and æsthetic activities of life. Of course.

there are very few subjects which have no direct value, and it becomes a question of comparing the relative amounts involved. It must not be forgotten that such values may be general and common to all pupils, or may be true for only a limited number. There are some branches of knowledge, for example, whose value may be called "consumption value." Of these branches, all the knowledge which the majority needs is that which enables them to use intelligently the results of scientific investigation. In other cases expertness in "production" must be attained, *e.g.*, in the ability to write. And lastly, while some direct values are certain to accrue, others are obtained only under specific conditions. This is true, in part, of the results obtained from acquiring the ability to converse in a foreign tongue. When the environment affords continuous opportunity for the use of this language the values are certain; when the individual must go to another country to make use of this training, the values are at best contingent. Contents of direct, universal, and certain value deserve prior consideration in the preparation of a programme of studies, and should be considered as "constants."

Certain subjects have been retained on programmes of study for a very long time on the grounds that they develop general abilities. If any such assumptions can be proven, then no other reasons need be provided for making these subjects "constants." Obviously, the problem is psychological, and the only solution is an experimental study of the facts. Such experiments as have been made indicate that normally no such general training is obtained. The pupil may form habits of study and ideals of conduct, and may then generalize these, if the teacher undertakes to have such transfer effected. Where there are identical elements in method or content, such transfer will be effected more readily. The general principle may be stated thus: generalization of habits, ideals, and technique is possible, but such transfer does not take place automatically. Even though some transfer has been found in certain experiments, in every case the amount of general training was so small as to be practically negligible. Thus Meumann, who claimed to find that some general training of memory capacities results from the use of a certain specific type of material, pointed out, nevertheless, that the amount of transfer was small, and that with so much available material of direct value we simply have no time for teaching a subject which provides only or chiefly general training. Certain subjects, such as Mathematics, do provide for the formation of habits which can be generalized, but the transfer is contingent, and not inevitable. No subject of study can be admitted to, or retained in, a programme of studies primarily, or chiefly, because of its general disciplinary value. Hence, in considering the justification for the retention of such subjects as Mathematics and the Classics, we are forced to discover some more specific values for these subjects or abandon them altogether. That such specific values do exist is recognized, and it is unfortunate for these subjects that any attempt has been made to retain them on grounds which, psychologically, are largely mythical. Exactly the same statement must be made with regard to the alleged training of memory which is supposed to result from the study of history. In the first place, there is no general faculty of memory to



be trained; what we call memory is only a convenient term for a group of memory capacities, and it is a well-known fact that a pupil may have a good memory for historical facts, but a poor one for mathematical or chemical formulæ. This in itself should have suggested that the training of memory really means the training of memories for specific types of material.

In this course, therefore, no reference will be made to such generalized and disciplinary values, excepting to indicate those branches of study which do provide the best opportunities for generalization. For example, it will be pointed out, in the introductory statement to Mathematics, that these subjects provide more opportunities than do most other branches for the formation of a scientific method of study. Whether or not a general training of this sort will be secured will depend on the extent to which the teacher undertakes to have such transfer effected.

The statement of aims and values has been made in some detail, inasmuch as it is believed that the teacher is desirous of knowing the legitimate potential objectives in his work, and the reasons for the selection and arrangement of the material in a curriculum. Education must no longer be a blind process of faith; it is now becoming the sphere of the master craftsman engaged in the building of the greatest structure the world knows—a human life.

# ART 1

*N.B.*—This course is compulsory for those who are preparing for Normal Entrance *only*. By recent action of the Senate of the University of Alberta, this course will be accepted for credit towards Matriculation in lieu of Agriculture 2.

## Introduction.

The value of Art as a subject of study is debated today, perhaps more keenly than at any time since its introduction into the curriculum. Two reasons may be given for this. In the first place, Art, to many persons, has been a thing apart from the rest of the school programme, something that a few enthusiasts dabble with, an opportunity for relaxation in an otherwise serious day. The subject has been treated with easy tolerance; though it did little good, it probably could do no harm. This position has been challenged by modern educators, and it has been demonstrated that Art can be made to live and function in the everyday life of common man. They maintain that Art enlarges the scope of the common life by "creating a new imaginary world to which we can all belong, where action, enjoyment, and experience do not involve complications or depend upon possession or mastery." This statement applies not only to Art in literature or in music, but to visual Art as well, whether as Fine Art, as Art applied to surroundings in interior decoration, costume, houses, grounds, or all the varied articles we purchase with the hope that they will add to the beauty and congeniality of our surroundings. In the second place, Art is a matter of judgment, of discrimination, of appreciation of things in their proper setting. Just as Science enlarges our knowledge of the origin and make-up of things, so Art, its great counterpart, presents things purified, leads to a true appreciation of beauty, enlarges and enriches life experiences through its imagination, and fits for the more complete enjoyment of the leisure which society is gradually demanding as the right of every man. It follows then that many persons, who themselves entirely lack such training, will find it difficult to see that opportunities for the development of the æsthetic should be provided for the generation now in school. In spite of these prejudices, progressive people everywhere are including in their programmes of study more or less complete systems of Art education.

It is expected that when a student enters High School he will be familiar with the mechanical part of the subject; that he has learned to see and draw to some extent; that his powers of representation have been awakened in some degree; and that he can analyze and compare, and draw conclusions. Hence the work in secondary schools should require more thought and more creative ability. Drawing should take on a deeper significance. Why is it

that when objects are arranged in a certain way, the appearance of the group is improved? Are there laws governing the arrangement of lines and areas which make the general effect pleasing or otherwise? Why do certain colors fail to harmonize? Can color combinations be analyzed? Can this knowledge be applied to the improvement of our surroundings, no matter how humble they may be? Is it possible to enter into the thoughts of those who have designed noble buildings or created a masterpiece? The modern Art course undertakes to develop in the child the power to do these and other similar things.

Again, we must realize that from our High Schools must come the future teachers of Art. Teachers of the elementary grades in this Province are coming more and more to be the product of Alberta High Schools. It is of the utmost importance, then, that those who are looking forward to the work of teaching should not only bring their own technique to a high state of perfection, but should appreciate the purpose of Art education in the training of children.

Much experimental work has been done in the matter of teaching Art in High Schools. Since the type of Art taught in our schools has been broadened and adapted to the needs of the majority of people, who may not follow the arts professionally, but who desire a finer taste and a greater capacity for appreciation, a corresponding change has taken place in the scope and arrangement of the subject. The course today is based largely upon the proper spacing, arranging, and selection of lines, forms, and colors. This is followed by the application of these principles to planning and arranging lines and spaces in the construction and decoration of familiar objects about us. To do this it is necessary to review certain principles of drawing. In all this work there is a constant challenge to the thought of the student, and interest is stimulated by pointing out the connection of some phase of the subject with conditions about us, or by comparing the Art of the past, in its various applications, with that of today.

Almost the first problem to be considered in preparing a course in Art for Secondary Schools is the standard or quality of work to be required. Because of the great variation in standard as between one-teacher Rural Schools and the highly organized Urban School, it is impossible to set up a high standard in this subject, which could be as rigidly adhered to, as in such a subject as Algebra, for instance. Frequently, because of a bad start in the subject in the earlier grades, the pupil dislikes Art and distrusts his ability to do even passable work before he ever reaches the High School. For these reasons difficult work such as figure-drawing has been entirely omitted from the course. The drawing required is not difficult, provided the pupil has a fair foundation and average intelligence.

The course here outlined is a natural sequence to the work required in Grades VII and VIII, and is planned to meet the needs of the average pupil, and at the same time to prepare the students who later intend to teach Art in the elementary grades. This course is drafted on the expectation that about 200 minutes per week will be available for Art. There should be no difficulty in

securing this amount of time in the large High Schools, but in the smaller schools and continuation classes, it is suggested that the teacher present the subject, start the pupils at work, and then take up another subject with another class, and later review the work done, criticize, give helpful suggestions, and allow the pupils to continue until the work is completed. There is no reason why good work cannot be accomplished in this manner, and the pupil have the full allotment of time for the subject.

### **Technique of Teaching.**

It is unwise for any teacher to attempt any Art teaching in the High Schools without adequate illustrative material. For this purpose several books, having excellent illustrations, are recommended. If the teacher has no particular creative ability, he may enlarge many of the illustrations on sheets, say, about  $14 \times 22$  inches. These can be seen readily from any part of the room, and should be used to illustrate the point at issue, to form a standard of work, and give a wealth of suggestion to the student. The ambitious teacher will not stop until he has a portfolio of reference material, illustrating each division in the course. This material is not, of course, to be copied by the pupil, but should set standards for attainment.

### **Materials.**

As a rule the average student should not attempt large work. It is therefore suggested that the work be done on  $9 \times 12$  paper arranged as plates in a portfolio, or (better still) on  $12 \times 18$  paper folded once and made into signatures, as for a book, and later bound as described in the elementary course for Grades VII and VIII. In such a book, or on accompanying plates, notes should be carefully printed, explaining clearly but tersely the main principles in the exercise and the aim to be achieved. As these notes will be reviewed from time to time, the pupil will thus gradually develop an æsthetic judgment, based upon sound principles. The illustrations should not as a general rule be larger than  $6\frac{1}{2} \times 9$  inches. This leaves space for a border on  $9 \times 12$  paper. Some illustrations, for teaching purposes only, may be quite small, not more than  $2 \times 3$  inches.

Other materials are—a good HB pencil, a soft eraser, pen, India ink, two brushes (as No. 2 or No. 3, and No. 7 or No. 8) and an 8-color Water-color box, or Tempera or Show Card colors, Red, Yellow, Blue, Black, and White. White should be purchased if a water-color box is used.

It is recommended that pupils be asked to cut from good magazines all material that in any way has reference to the work required. These cuttings may be classified and mounted in a scrap book. They form standards that will stimulate the pupil. Under no circumstances should these be copied as a completed exercise.

The time mentioned in each exercise is to assist in giving an equitable amount to each problem. From actual experiment, the time stated has been found somewhat excessive in every instance. It should be possible to adequately cover the course, if the pupils have a reasonable foundation, in a shorter period than the aggregate of the periods stated, and thus leave ample time for review.



Reference books required for this course may be secured from the School-book Branch, Department of Education, Edmonton.

Lemos: *Applied Art* (\$5.00).

Brown: *Applied Drawing* (\$1.75).

Izor: *Costume Design and Home Planning* (\$1.60).

Calkins: *House Planning and Furnishing* (\$1.25).

Recommended:

Parsons: *Interior Decoration* (\$4.50).

Statham: *A Short Critical History of Architecture* (\$5.50).

Daniels: *Furnishing a Modest Home* (\$1.50).

## Part I.—Drawing from Nature: Perspective

EXERCISE I.—Time, 2 weeks.

Make with pencil and pen and ink careful detail or analytical sketches of *plant* and *insect forms*. Preserve these for use in later design exercises.

(*Applied Drawing*, pp. 58, 61, 72, 82.)

(*Applied Art*, pp. 173, 350.)

*Materials*—Drawing paper, pencils (HB and BB), pen, India ink.

*Aim*—Accurate rendering in line; in observation.

EXERCISE II.—Time, 5 weeks.

(a) Review the principles of circular, parallel and angular perspective, and draw groups of objects involving these principles.

(b) Draw in outline a corner of a room. At one side, near the corner, show a door partly open.

(c) Make a drawing of a simple building standing at an angle to the observer. Show a chimney, door, and windows and the projection of the roof. Indicate lightly a few surroundings, as trees, shrubs, walk, etc.

(d) Teach the theory of light and shade. Teach pencil, and pen and ink technique, and allow children to complete in light and shade one or more of the drawings made above.

(*Applied Drawing*, pp. 137-159; 166-177.)

(*Applied Art*, pp. 226-227; 239-240; 334-335; 339.)

*Materials*—Suitable objects for grouping, drawing paper, pencils, India ink, pen.

*Aim*—Training in careful observation of objects with correct drawing of the same. Application of the principles of perspective.

## Part II.—Design and Color Theory

Good taste in the field of art is ability to make fine choices. It is based upon an appreciation of the principles of design.

EXERCISE III.—Time, 2 weeks.

(a) Review the purposes of design, viz., to produce articles for use or decoration, and to make them as beautiful as possible. Present to the class drawings or illustrations of good and poor forms of

objects, for contrast; and name and explain the following principles of design:

1. *Proportion.*

(*Applied Drawing*, pp. 13, 14, 24-27, 34-37.)

(*Applied Art*, p. 258.)

2. *Dominance.*

(*Applied Drawing*, pp. 15, 16.)

(*Applied Art*, pp. 258, 268-270, 352, 357.)

3. *Rhythm.*

(*Applied Drawing*, pp. 19, 30-31, 37, 53, 98.)

4. *Balance.*

(*Applied Drawing*, p. 50.)

(*Applied Art*, pp. 259-261.)

5. *Harmony.*

(*Applied Drawing*, pp. 50, 53, 62, 91, 98.)

(b) Make small, simple, freehand sketches to illustrate the above principles, one for each principle. These need not be carefully finished.

EXERCISE IV.—Time, 3 weeks.

A review of the color theory of Grade VII and VIII, with several additional exercises. Be sure the terms and definitions are understood.

(a) Make a color circle of twelve hues from the three basic colors.

(b) Change the "value" of a color by adding white or black.

(c) Change the "intensity" of a color by adding its complement.

(d) In a series of rectangles arranged vertically make a color chart of nine values from white to black.

(e) Arrange each of the twelve hues (a) or similar ones opposite its corresponding value in the scale (d).

(f) Show the application of grayed washes with particular attention to the intermediate hues (grayed red-violet, grayed blue-green, etc.).

(g) Review the color harmonies—complementary, split-complementary, monochromatic and analogous—and use these where suitable, in subsequent exercises.

EXERCISE V.—Time, 3 weeks.

(a) Discuss the nature and use of the following types of decorative design: naturalistic, conventional and abstract. Demonstrate from a suitable motif how each type is developed. Make freehand sketches of graceful curves and fill spaces with the same as shown on p. 46 of *Applied Drawing*.

(b) Take the drawings of one of the plant or insect forms (Part I—Exercise I) and render from them simple conventionalized forms for filling such spaces as a triangle, rectangle, or circle.

Render first in a naturalistic design, then in a conventionalized design, and last in an abstract design.

Finish in flat washes of a grayed complementary or split-complementary color scheme if time permits.

EXERCISE VI.—Time, 2 weeks.

From the plant drawing in Exercise I, arrange a plant composition to fill a definite figure as a rectangle, triangle, etc. For guidance, refer to the principles of design and criticize the results. Correct and improve where necessary and finish in a suitable harmony of flat colors.

(*Applied Drawing*, pp. 76-79.)

(*Applied Art*, facing p. 242, and p. 264.)

*Aim*—To create a plant composition in which the features are arranged in a pleasing manner according to the laws of design.

To secure a good color harmony and a balance of tones.

### Part III.—Lettering

EXERCISE VII.—Time, 3 weeks.

(a) With a lettering pen practise making a single line alphabet (capitals and small letters).

(b) Make a Roman alphabet of upper-case (capitals) and lower-case (small) letters. Give close attention to the proper spacing of the letters.

A good grouping of capital letters is as follows:

- |                       |                   |
|-----------------------|-------------------|
| 1. Straight line..... | I H E F L T       |
| 2. Slant.....         | V W X Y Z A K N M |
| 3. Round.....         | O Q C G S         |
| 4. Composite.....     | P B R D J U       |

(*Applied Drawing*, pp. 106-108.)

(*Applied Art*, pp. 188; 320-321; 325.)

*Materials*—Paper, pencil, spoonbill and Old English text pens, India ink.

*Aim*—To obtain facility in the use of lettering pens, and to study the Roman letter type.

EXERCISE VIII.—Time, 2 weeks.

Make a motto, using a space not less than  $10 \times 7\frac{1}{2}$  inches. Roman letters or a modified type of line letters should be used. An initial letter and border should be included.

Plan to work carefully. Draw guide lines for lettering in very fine pencil lines. Lightly sketch in freehand outline the words of the motto, paying careful attention to arrangement, size and spacing of the letters and words.

(*Applied Drawing*, p. 100.)

(*Applied Art*, pp. 214, 320, 321, 325, 332.)

*Materials*—As above.

*Aim*—(a) To give practice in the use of the alphabets taught.

(b) To have children appreciate the decorative qualities of the Roman letters.

#### **Part IV—The Home and Its Surroundings**

See *House Planning and Furnishing*, by Calkins.

See *Costume Design and Home Planning*, by Izor.

EXERCISE IX.—Time, 2 weeks.

(a) Plan the grounds about a house or bungalow. Suppose the area to be about  $100 \times 150$  feet. Provide for any or all such features as a garage, greenhouse, shrubs, trees, flower and vegetable gardens, and walks.

(b) Make a drawing of the front elevation of a house or bungalow. Carefully observe the principles of design in spacing the areas for windows, doors, walls, and roof.

EXERCISE X.—Time, 3 weeks.

(a) Discuss the decoration of several of the rooms in the home, *e.g.*, living-room or dining-room, kitchen or bedroom.

Consider the color schemes suitable for various rooms; curtains, drapes and their uses.

Consider how best to create a centre of interest by the choice and placing of furniture, hangings, pictures, etc., and the effects of horizontal and vertical lines in a room. Make rapid sketches and color.

(b) In a space about 10 inches wide draw an elevation of the wall of a room, including windows and fireplace or both. Show some articles of furniture (in elevation only) along the wall. Endeavor to create harmony between wall-trim, furniture and hangings.

Finish in an appropriate color scheme.

*Materials*—Paper, pencils, ruler, colors. Illustrative material collected from magazine advertisements by the pupils themselves.

*Aim*—To gain skill in the application of Art principles to practical life.

#### **Part V.—Architecture and Picture Study**

\*(The numbers, and references are those of the pictures in the Perry Print Catalogue, Malden, Mass.)

Time, 3 weeks.

(1) A comparison study of a number of leading styles of Architecture. To note the general transition from one style to another, and the outstanding features of each.

(a) The Classic or Grecian style—Parthenon.

(b) Roman—Round arch and dome—Pantheon, 1774.

(c) The Romanesque—Pisa Cathedral, 1716.

(d) The Gothic—Notre Dame, 1546; York, 1504.

- (2) The appreciation and comparison of a few national types of Fine Art.

Time, 4 weeks.

(a) Study of National types.

Italian—Sistine Madonna (Raphael), 321.

German—George Gisze (Holbein), 700D.

Flemish—Descent from the Cross (Rubens), 636.

French—Dance of the Nymphs (Corot), 485.

The Sower (Millet), 510.

The Song of the Lark (Breton), 575.

Natural—The Fog Warning.

British—Mrs. Siddons (Reynolds), 871.

The Cornfield (Constable), 890.

American—My Mother (Whistler), 1010.

Fog Warning (Homer), 1041.

(b) Comparison Study.

Portraits—George Gisze, Mrs. Siddons and Whistler's Mother.

Figure Compositions—Sistine Madonna and Descent from the Cross.

Landscapes—Dance of the Nymphs and The Cornfield.

Ideal—The Sower and The Song of the Lark.

Manuals: *Picture Study*, Hedley; *Architecture*, Hedley.

\*It is expected that colored reproductions of the pictures assigned for study in Art 1 and 2 for 1930-31 will be available through the School Book Branch.

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## ART 2

This course parallels that of Art 1, and is so arranged that it is quite possible in smaller High Schools to teach both Art courses at the same time. The pupils who are taking Art 2 would benefit greatly by a review of Art 1, and this would prepare them for the exercises in Art 2. The additional work in Art 2 is largely a training in handling such mediums as the pencil, pen and ink, and color.

In Art 1, emphasis is placed on the development of taste; that is, the formation of a critical art judgment, while in Art 2 it is on acquiring skill in handling mediums. Hence the work should be completed on large sheets of paper, not less than 8×12 inches, and often on 12×18 inches, or even larger paper, as for the poster. Those papers should be selected which are suitable for the particular medium to be used, i.e., paper suitable for pencil is generally not adapted for pen and ink.

In this course, pupils are not expected to make any note book unless for the work on picture study.

N.B.—For reference books for this course see list for Art 1, given on page 15.



## Part I—Principles of Drawing

EXERCISE I.—Time, 2 weeks.

With pencil and with pen and ink draw various tree shapes and bird forms in outline for design purposes. Study both decorative and naturalistic rendering in pen and ink and render a tree and its surroundings in both methods.

(*Applied Art*, pp. 252, 253, 257, 258, 121, 126, 130.)

*Materials*—Paper, pencils, pen and India ink.

*Aim*—Careful observation of nature forms.

Note the distinction between naturalistic and decorative rendering of nature.

EXERCISE II.—Time, 5 weeks.

(a) Review the principles of circular, parallel and angular perspective. Show the use of guide lines in drawing handles and spouts in various directions.

Draw a group of objects including at least one cylindrical object having a handle placed at an angle to the observer. Render in light and shade, using pen and ink.

(b) Review the drawing of cylinders lying at an angle to the observer. Draw in light and shade, using pen and ink, a boy's express wagon, or an object of a similar type, which stands at an angle.

Or

(c) Review the method of drawing surfaces placed in an oblique position.

Draw in light and shade a gable house which has one section at right angles to the main part. The building stands at an angle. Give attention to drawing the roof, its projection, the chimney, doors, windows, and suitable surroundings.

*Materials*—Suitable objects, drawing paper, pencils, India ink, and pen.

*Aim*—Training in careful observation of objects and correct drawing of them. Application of the principles of perspective.

## Part II.—Design and Color Theory

EXERCISE III.—Time, 2 weeks.

Review the principles of design, particularly with regard to the construction and decoration of objects. Present to the class drawings or illustrations of good and poor forms of objects for contrast.

(1) Proportion. Illustrate by drawing a fine vase or candlestick in outline.

(*Applied Drawing*, pp. 118-120.)

(2) Dominance. Illustrate by drawing a rug with a band as the dominant feature.

(*Applied Drawing*, pp. 24, 25.)

(3) Rhythm in design, composition of pictures.

(*Applied Drawing*, pp. 50, 51. "The Pot of Basil," by Alexander. Draw a good example.)

(4) Balance. Illustrate by drawing a design for a fireplace with a wood mantel.

(*Applied Drawing*, p. 132.)

(5) Harmony of line. Illustrate by sketching design units.

(*Applied Art*, p. 252.)

*Materials*—Paper, pens, brush, India ink.

*Aim*—Review of the above principles with emphasis on their application to structural design.

EXERCISE IV.—Time, 3 weeks.

Review color theory and color harmony in Art 1, Ex. IV. Trace a design as on page 255, *Applied Art*, and work out Exercise (g) Art 1. Try to secure a balance of tones.

*Materials*—Water colors or tempera colors, brush, drawing paper.

*Aim*—To secure skill in mixing colors and applying grayed washes to restricted areas.

EXERCISE V.—Time, 3 weeks.

(a) Review the following types of design: Naturalistic, conventional, abstract.

In decorating various articles, discuss which type is most suitable, as for stencil, embroidery, leather work, metal work, cement, etc.

(*Applied Art*, pp. 294-309.)

(b) From a drawing of a tree or bird form (Exercise I) render a naturalistic design, then a conventional design and, lastly, an abstract design, suitable as decoration for some object, either for a stencil, leather work, cement tiles, or other craft work.

(*Applied Art*, pp. 294-307.)

Finish in flat washes of a grayed complementary or split-complementary color scheme.

*Materials*—Suitable motif, paper, pencils, colors, brushes.

*Aim*—To adapt some motif as a decorative unit to a definite material.

EXERCISE VI. Time, 2 weeks.

From a photo of a landscape or half-tone picture which may include a small building, by the use of finders, select a good composition. Enlarge this to fill a definite figure, as a rectangle, half-circle, etc. Break up the larger areas if necessary. On the basis of the principles of design, criticize your result and correct where necessary. Render in a monochromatic or an analogous harmony of flat colors.

(*Applied Drawing*, pp. 160-165.)

(*Applied Art*, pp. 206-207, 268-270.)

*Aim*—To create a plant composition in which the features are arranged in a pleasing manner. To secure a good color harmony and a balance of tones.

### Part III.—Lettering

EXERCISE VII.—Time, 2 weeks.

Make a poster alphabet of capital letters and numerals, having two widths of stroke (similar to Roman), but of proper proportion to be most effective when viewed from a distance.

EXERCISE VIII.—Time, 2 weeks.

Plan and make a poster not less than 12×18 inches. Take such a subject as "Safety First" and work out the illustration and wording as a unified composition. Render in a color scheme with a strong value contrast.

*Materials*—Paper, pencils, colors, India ink.

*Aim*—To determine the proper proportion of the letters in a poster alphabet and apply this in making a poster. To make a poster, having one idea, well expressed.

### Part IV.—The Home and Its Surroundings

See *Costume Design and Home Planning*, Izor, pp. 96-126.

EXERCISE IX.—Time, 2 weeks.

(a) Briefly discuss the purpose of town planning; the arrangement of buildings, color schemes, boulevards, trees, parks and playgrounds in such a plan.

Discuss the relative merits of formal (Italian) and informal (English) planning of a park. From a topographical map of a quarter-section, plan a park in either of the above types. Show drives, walks, shrubs, trees, flowers and other usual features arranged in an attractive manner.

(b) Discuss the appearance of the front elevation of several types of houses which have some elements of character. Sketch one type in elevation; show also trees, or shrubs. Render in an appropriate color scheme.

EXERCISE X.—Time, 3 weeks.

Study a few outstanding types of period furniture and the nature of the walls which accompany each type. Discuss other accessories as curtains, drapes, rugs, pictures, lighting fixtures, etc.

In a space 10 inches wide draw an elevation of the wall of either a living-room, dining-room or bedroom, showing some type of furniture. This wall should include windows or fireplace or both. Include lighting fixtures, curtains, and other furnishings if necessary. Endeavor to create a harmony throughout. Finish in an appropriate color scheme.

*Materials*—Paper, pencils, ruler, colors. Illustrative material collected from magazine advertisements and from any other good source by the pupils themselves.



*Aim*—To gain skill in the application of Art principles to practical life.

## **Part V.—Appreciation of Sculpture and Modern Art**

### **PICTURE STUDY.**

The comparison method of study is recommended. A brief historical outline of the development of modern art, with an understanding of such terms as Realists, Academists, Romanticists, Pre-Raphaelites, Impressionists, Neo-impressionists may be had on application to the School Book Branch, Department of Education.

#### *Buildings.*

The Guidecca, Venice (Turner), F-98.  
Broad and Wall Streets (Hassam), H-111.

#### *Bridges, etc.*

Rain, Steam, and Speed (Turner), F-100.  
Battersea Bridge (Whistler), H-49.

#### *Landscapes.*

The Poplars (Monet), E-164.  
Autumn (Innes), H-40.

#### *Figures.*

The Pot of Basil (Alexander), H-89.  
Carmencita (Sargent), H-95.

#### *Symbolism.*

Hope (Watts), F-119.  
Star of Bethlehem (Burne-Jones), F-143.

### **SCULPTURE.**

The aim is to sketch briefly the origin and development of sculpture, to study a few outstanding examples, and to compare ancient Greek sculpture with modern.

- (1) The Discus-thrower (Myron), A-62.
- (2) The Wounded Amazon (after Polyclitus), A-118.
- (3) Moses (Michelangelo), C-451.
- (4) The Thinker (Rodin), M E-21.
- (5) Appeal to the Great Spirit (Dallin), H-141.

(The numbers following the above subjects are from the University Prints Catalogue, Newton, Mass.)

# ENGLISH

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"Above all, the children should discover the delight of books. Here the great crux is in the personality of the teacher. People may be able to use books, may even be able to write lucid and correct English, without necessarily any real feeling for literature—as a delight, that is, in perfect expression. But if it is to be felt in this way, it must be entrusted to teachers with a love of it, and with a faith that children can love it too."—Sir Henry Newbolt, in the Report on *The Teaching of English in England*.

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## Aims and Values of English.

The term "English," as here used, embraces—

- (a) English Literature.
- (b) English Language, including Composition and Rhetoric, Spelling and Grammar.

In making English a compulsory two-unit subject in each of the four years of the High School course, it is recognized that English, because of its many values, both direct and indirect, is the most important subject of the High School course.

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## ENGLISH LITERATURE

The values and aims of the study of English Literature may be stated as follows:

1. The study of English Literature has an important value in preparing the student to be a good citizen and a co-operating member of society. This result is attained in four ways:

- (a) By familiarizing the student with the group experiences, traditions, conventions, and customs of the society into which he is born, a social integration is effected; for the dominant ideals, customs and traditions of a race are its spiritual inheritance, embodied in its literature.
- (b) The student is brought into contact with human experiences and human conduct *in complete variety*.
- (c) The training received from history and the sociological sciences is supplemented by the study of *individual conduct* in all the multitudinous affairs and phases of everyday behavior. The abstract principles of group behavior are enriched and clarified by the concrete bits of wisdom to be found in the conduct of an individual in the ordinary affairs of life.
- (d) The study of literature builds character by arousing admiration for great personalities and the noble deeds of

heroes; and to the impelling power of those emotions which are integrated in the sentiments, there is to be added the habit of weighing and judging human conduct.

2. The great direct value of literature is its avocational value for the individual. Literature is a source of enjoyment, inspiration, and information suited to all times, ages, and places. People will read. They must, therefore, be trained to utilize their leisure time in reading in the right way what is most worth while.

3. Again, students must be trained to develop standards of taste and appreciation in keeping with the social and civic ideals of the time. The important thing for most students is the ability to use and appreciate literature intelligently—to be a consumer of literature; although not necessarily a producer or even a critic.

4. As an aesthetic art, literature makes its appeal to the emotions, and to the creative imagination. For the *elite* who have the necessary capacity and endowment, this value is of course paramount, since it is from this class, largely, that our producers of literature will be drawn.

5. By the study of literature the student can be led to develop a concept of style as the essential attribute of literature. He should be trained to interpret the best thoughts of the best authors, when these are expressed in a highly developed form, and in a manner which gives them distinction. The exceptional language of a fine passage, or of a "memory gem," unconsciously becomes a part of the student, and enables him to give more effective expression to his own thoughts and feelings.

### **How the Course is Divided.**

The Literature course has been divided into two parts, namely, Literature for class study, and Supplementary Literature. The former is to be studied intensively in class; the latter is for outside reading by the pupil under the guidance of the teacher.

### **Subject-matter of the Course in Literature for Class Study.**

In English 1 and 2 the material for class study is largely narrative, and has been chosen because of its inherent interest for pupils of the junior High School grades. There are certain selections, however, which are subjective in their nature, and which will require a careful treatment on the part of the teacher to gain and hold the interest of the pupil. In English 3 and 4 subject-matter possessing deeper qualities of thought, and requiring greater powers of interpretation, has been introduced.

In English 1 and 2, selections have been included from some of the greatest living writers of prose and verse. Attention has also been given to Canadian literature, and in both the prose and poetry prescribed for study there will be found a number of selections chosen from the works of recognized Canadian authors.

### **Subject-matter of the Course in Supplementary Literature.**

The course in Supplementary Literature is divided into two parts: (1) obligatory, and (2) recommended. All pupils will be

required to read the obligatory texts, and pass the test based on the work. The recommended list is suggestive only. There will be a large number of pupils (particularly in the larger centres, where books are readily accessible) who will read widely outside of the compulsory list. The recommended list is intended to meet the needs of this type of student. It should be the duty of the teacher to direct the attention of his classes to these additional books, as containing matter that will both interest and profit them, and to stimulate and encourage the less eager pupils to read at least some of them.

On the whole, the material prescribed for study as Supplementary Literature is lighter in vein than that required for class study. An attempt has been made to secure books which have a reasonably high value as literature, and which the average pupil will read during his leisure hours from interest and for entertainment.

### **Need of Further Directing the Home Reading of Pupils.**

While no place is given in the course of study to the reading of current literature in the form of the daily newspaper, magazines, and periodicals, an important duty devolves upon the teacher of English in this respect. Pupils should be taught the proper methods of reading the daily paper, and given instruction as to the values of current magazines and periodicals from the standpoint of information, ideals, and literary qualities. The teacher should strive to develop among his classes a love for the best and most wholesome current literature, without conflicting too much with the innate tastes of the adolescent boy or girl.

### **Memorization.**

The influence of the lesson in literature can be extended indefinitely by the memorization of choice passages. The pupil's mind on leaving school should be a store-house of stimulating thought, beautiful pictures, and fine phrases. The results will be higher ideals, a larger vocabulary and a finer choice of words. The teacher should encourage the pupil to memorize short passages of special excellence chosen from the poetry and prose studied. Exactness in memorization should be insisted upon. Instruction should be given in the best methods of memorizing expeditiously and effectively.

### **Reading.**

It will be found practicable to give instruction in Reading in connection with the course in Literature. While Oral Reading is not given in modern High School curricula, the position of importance that it once held, it is nevertheless deserving of a place in our scheme of English instruction. The time comes in the life of almost every High School graduate when he will be called upon to read the printed page, either for the instruction or the entertainment of others. Practice in reading should be given throughout the course.



## **Suggestions as to Method in Particular Forms of Literature.**

### **(a) The Short Story.**

This type of literature appears only in the Grade IX course. As the interest in the short story makes a strong appeal to the pupil, he may be assigned to read it as a task in home preparation. In class, emphasis should be laid upon the plot, the portrayal of character and the interest derived from local color. Technicalities of structure should not receive attention, and the study of the language should be confined to the meanings of words and phrases necessary for the intelligent interpretation of the story. The teacher should point out particularly beautiful or striking passages.

### **(b) The Novel.**

The novel makes its appearance first in English II. As a form of literature it presents a long concentrated study. The teacher, therefore, should exercise particular care in making a skilful approach. Many a student has developed a dislike for some of our best fiction, simply because he was unable to understand the setting, or grew wearied of long explanatory opening chapters. Difficulties of this nature should be removed by the teacher at the outset. It may be necessary to give an oral picture of the time with which the novel deals, to supply the pupil with the necessary background for interest. It may even be necessary to omit, for the time being, uninteresting chapters. At any rate, the first impression which the student receives should be an attractive one. As the study of the novel proceeds and as interest grows, the pupil should be assigned chapters for home reading. When the story has been completed, there should follow a general study in the form of a class discussion in which careful consideration is given to the following points:

- (1) The development of the plot.
- (2) The development of the characters.
- (3) The author's aim or problem of the author.
- (4) The value of the work.

### **(c) The Drama.**

In studying a drama of Shakespeare's, the pupil should first make a rapid survey of the play as a whole. This should be followed by an intensive study of the text, in which the difficulty arising from the interpretation of the language and the meaning of the allusions is removed. As the work proceeds, emphasis should be placed on the development of plot and of character, and pupils should be encouraged to weigh and judge the actions of those whose lives are being portrayed. The completion of this detailed study should be followed by a second general survey, in which is made an analysis of the action rising through its complicating forces to a climax, and falling through its resolving forces to a conclusion. The study of sources, metre, etc., should be adapted to the development of the class in which the play is being taken.

### **(d) The Short Poem.**

There is generally a clear and well-defined purpose in prescribing a short poem for study. Usually this is found in the appeal

that comes from surpassing beauty in the thought or language, or the exceptional value in the truth or ideal presented.

Great care should be taken by the teacher in presenting a short poem to secure the desired effect. If a good reader, the teacher should read the poem to the class himself. If not, he should require some pupil with good powers of interpretation and expression to read it for the pupils. This should be followed by a method of treatment which will bring out the particular quality of the poem which needs emphasis. In doing this, the teacher should prevent the lesson from falling to the level of a mere "quiz" about more or less unrelated facts, as is so often the case with the instructor who is lacking in enthusiasm. The aim should be to inspire the pupil, and to leave with him a lasting impression of beauty in the language or thought.

## ENGLISH 1

### LITERATURE

#### \*I. An elementary study of rhythm in verse:

##### (a) The foot of two syllables.

Iambic, trochaic, and spondaic feet.

##### (b) The line.

Monometer, dimeter, trimeter, tetrameter, pentameter, hexameter and heptameter verse.

##### (c) Scansion of regular iambic and trochaic metres.

#### II. An intensive study in class of the prescribed selections from a two-year cycle.

### First Year of the Cycle (Series I)

#### A. Poetry.

Old Ballad: *Sir Patrick Spens*.

Old Ballad: *Robin Hood and Little John*.

Aytoun: *The Burial March of Dundee*.

Macaulay: *The Battle of the Lake Regillus*.

Wordsworth: *The Daffodils*.

*The Green Linnet*.

Keats: *The Grasshopper and the Cricket*.

*On First Looking into Chapman's Homer*.

Burns: *To a Mouse*.

Shelley: *The Cloud*.

Byron: *The Eve of Waterloo*.

Longfellow: *The Warden of the Cinque Ports*.

Wilfred Campbell: *England*.

Vernède: *The Sea is His*.

Austin: *A Voice from the West*.

Shakespeare: *The Downfall of Wolsey*.

Kipling: *If—*

Newbolt: *Clifton Chapel*.

Scollard: *Riding with Allenby*.

Browning: *The Glove*.

\*Material covering this study will be found in the Introduction to the authorized text in Poetry.

Whittier: *Snowbound*.  
Arnold: *Sohrab and Rustum*.  
The Bible: *Ecclesiastes*.

**B. Prose.**

Dickens: *A Christmas Carol*.  
Burroughs: *Sharp Eyes*.  
Hawthorne: *Mr. Higginbotham's Catastrophe*.  
Lamb: *Timon of Athens*.  
Addison: *Sir Roger at Church*.  
*The Coverley Witch*.  
Quiller-Couch: *The Roll-Call of the Reef*.  
Hardy: *The Three Strangers*.  
Lloyd George: *Irish Freedom*.  
The Bible: *The Story of Ruth*.

**Second Year of the Cycle (Series II)**

**A. Poetry.**

Old Ballad: *King John and the Abbot of Canterbury*.  
Old Ballad: *Guy of Gisborne*.  
Macaulay: *Horatius*.  
Browning: *Hervé Riel*.  
Aytoun: *The Island of the Scots*.  
Burns: *The Cotter's Saturday Night*.  
Byron: *The Isles of Greece*.  
Wordsworth: *The Solitary Reaper*.  
*To a Skylark*.  
Keats: *Ode to a Nightingale*.  
Arnold: *Balder Dead*.  
Shakespeare: *Scenes from King John*.  
Kipling: *The Ballad of East and West*.  
Newbolt: *The Old Superb*.  
Austin: *Is Life Worth Living?*  
Noyes: *The Highwayman*.  
Longfellow: *The Hanging of the Crane*.  
*The Ladder of St. Augustine*.  
Lowell: *The Vision of Sir Launfal*.  
Stead: *We were Men of the Furrow*.  
Pickthall: *The Shepherd-Boy*.  
Campbell: *A Wood Lyric*.  
Hagarty: *Funeral of Napoleon I*.  
Lampman: *The Violinist*.  
The Bible: *Psalm XCI*.

**B. Prose.**

Irving: *Wolfert Webber—Golden Dreams*.  
Burroughs: *Is it going to rain?*  
Hawthorne: *The Ambitious Guest*.  
Addison: *The Club*, from the *Spectator*.  
*The Coverley Hunt*, from the *Spectator*.  
Stockton: *The Griffin and the Minor Canon*.  
Stevenson: *Le Sire de Malétroit's Door*.  
Newbolt: *Saving an Army*.

Poe: *The Gold-Bug*.  
Lamb: *The Taming of the Shrew*.  
The Bible: *David and Jonathan*.

### III. Supplementary Literature. .

The books contained in the following two-year cycle are for the individual reading of the pupil under the direction and guidance of the teacher.

#### First Year (Obligatory)

Tennyson: *Enoch Arden*.  
Hawthorne: *The Wonder Book*.  
*Selected Stories from Canadian Prose*.

#### Second Year (Obligatory)

Longfellow: *Miles Standish*.  
Hawthorne: *Tanglewood Tales*.  
*Selected Stories from Canadian Prose*.

#### \*Recommended (for both years)

Stevenson: *Kidnapped*.  
*David Balfour*.  
Homer: *Odyssey* (Butcher and Lang's translation.)  
Cooper: *The Last of the Mohicans*.  
Duncan: *Dr. Luke of the Labrador*.

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## ENGLISH 2

### LITERATURE

#### †I. The study of rhythm in verse continued.

- (a) The foot of three syllables. Dactylic and anapaestic feet.
- (b) Rhyme. Beginning rhyme, end rhyme. (1) Single, (2) double.
- (c) Special metres. Blank verse, dactylic hexameter.
- (d) Scansion of easy blank verse and dactylic hexameter verse.

#### II. An intensive study in class of the prescribed selections from a two-year cycle.

#### First Year of the Cycle

##### A. Poetry.

Shakespeare: *Merchant of Venice*.  
Scott: *Lay of the Last Minstrel*.  
Tennyson: *Break, Break, Break*.  
Noyes: *The Searchlights*.  
Doyle: *A Private of the Buffs*.  
Clough: *Hope*.

\*The recommended list is suggestive only. A large number of pupils will read widely outside the compulsory list. The teacher will direct the attention of his classes to these additional books and encourage all pupils to read at least some of them.

†Material for this study will be found in the Introduction to the authorized text in Poetry.



Henley: *Invictus*.  
Kipling: *When Earth's Last Picture is Painted*.  
Holmes: *The Chambered Nautilus*.  
Seeger: *I Have a Rendezvous with Death*.  
Carman: *By Still Waters*.  
Theodore Roberts: *The Maid*.  
McCrae: *The Unconquered Dead*.

**B. Prose.**

Dickens: *A Tale of Two Cities*.

**Second Year of the Cycle**

**A. Poetry.**

Shakespeare: *As You Like It*.  
Scott: *The Lady of the Lake*.  
Tennyson: *You Ask Me Why*.  
Brooke: *The Soldier*.  
Newbolt: *The Vigil*.  
Holland: *Gradatim*.  
Campbell: *Men of England*.  
Foss: *The House by the Side of the Road*.  
Bryant: *To a Waterfowl*.  
Carman: *The War-cry of the Eagles*.  
Wilfred Campbell: *A Canadian Galahad*.  
Lampman: *The Truth*.  
Middleton: *The Canadian*.

**B. Prose.**

Eliot: *Silas Marner*.

**III. Supplementary Literature.**

The books contained in the following two-year cycle are for the individual reading of the pupil under the direction and guidance of the teacher.

**First Year (Obligatory)**

Scott: *The Talisman*.  
Parker: *Seats of the Mighty*.  
Tennyson: Selections from the Idylls—*The Coming of Arthur*, *The Holy Grail*.

**Second Year (Obligatory)**

Scott: *Ivanhoe*.  
Kirby: *The Golden Dog*.  
Four Longer Poems: *The Deserted Village*; *The Prisoner of Chillon*; *Michael*; *The Vision of Sir Launfal*.

**\*Recommended (for both years)**

Scott: *Kenilworth*.  
Wallace: *Ben Hur*.  
Doyle: *Micah Clarke*.  
Washington: *Up from Slavery*.

\*The recommended list is suggestive only. A large number of pupils will read widely outside the compulsory list. The teacher will direct the attention of his classes to these additional books and encourage all pupils to read at least some of them.

## ENGLISH 3

### LITERATURE

- \*I. An elementary study of special stanzaic and structural forms of verse.
- (a) The Spenserian stanza.  
Its form and use.
  - (b) The Sonnet.
    - (i) Shakespearean.
    - (ii) Miltonic.Their forms and thought.
- II. An intensive study in class of the following subject-matter from the two-year cycle.

#### First Year of the Cycle (First Series)

##### A. Poetry.

- Shakespeare: *Richard II.*  
Tennyson: *Lancelot and Elaine.*  
*Oenone.*  
*Of Old Sat Freedom.*  
*Ode on the Death of the Duke of Wellington.*  
*Locksley Hall.*  
Browning: *The Boy and the Angel.*  
*Up at the Villa, down in the City.*  
*The Lost Leader.*  
*Evelyn Hope.*  
Campion: *The Man of Life Upright.*  
Burns: *Duncan Gray.*  
Coleridge: *Kubla Khan.*  
Gray: *Elegy Written in a Country Churchyard.*  
Jonson: *Hymn to Diana.*  
Lovelace: *To Lucasta, on Going to the Wars.*  
Milton: *On His Blindness.*  
Shakespeare: *That time of year thou mayst in me behold,*  
*When in the chronicles of wasted time.*  
Shelley: *Ozymandias.*  
Wordsworth: *London, 1802.*  
*England and Switzerland, 1802.*

##### B. Prose.

- Macaulay: *Essay on Clive.*  
Drinkwater: *Abraham Lincoln.*

#### Second Year of the Cycle (Second Series)

##### A. Poetry.

- Shakespeare: *Julius Caesar.*  
Tennyson: *The Passing of Arthur.*  
*Ulysses.*  
*The Lady of Shalott.*  
*Love thou thy land.*  
*The Lotos-eaters.*

\*Material for this study will be found in the Introduction to "Tennyson, Browning and Representative Short Poems."

Browning: *Love among the Ruins.*  
*My Last Duchess.*  
*Home thoughts from Abroad.*  
*Prospice.*  
Burns: *John Anderson.*  
Coleridge: *Youth and Age.*  
Gray: *Ode on the Distant Prospect of Eton College.*  
Herrick: *Corinna's Maying.*  
Jonson: *To Celia.*  
Lovelace: *To Althea from Prison.*  
Milton: *To Cyriack Skinner.*  
Shakespeare: *When in disgrace with fortune and men's eyes.*  
*Let me not to the marriage of true minds.*  
Shelley: *To the Night.*  
Wordsworth: *Earth hath not anything to show more fair.*  
*When I have borne in memory.*

### B. Prose.

Knoblock: *Milestones.*  
Macaulay: *Essay on Warren Hastings.*

### III. Supplementary Literature.

The following books are for individual reading under the direction and guidance of the teacher.

#### First Year (Obligatory)

Dickens: *Oliver Twist.*  
Blackmore: *Lorna Doone.*  
Longfellow: *Evangeline.*

#### Second Year (Obligatory)

Dickens: *David Copperfield.*  
Trollope: *Barchester Towers.*  
Longfellow: *Evangeline.*

#### \*Recommended (for both years)

Kipling: *The Light that Failed.*  
Eliot: *The Mill on the Floss.*  
Goldsmith: *She Stoops to Conquer.*  
Sheridan: *The School for Scandal.*

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## ENGLISH 4

### LITERATURE

#### †I. A study of the subject-matter of poetry.

##### (a) The Epic.

The characteristics of the epic and its more important forms.

\*The recommended list is suggestive only. A large number of pupils will read widely outside the compulsory list. The teacher will direct the attention of his classes to these additional books and encourage all pupils to read at least some of them.

†Material for this study will be found in the Introduction to "Milton and Representative Short Poems."

(b) The Lyric.

The characteristics of lyric poetry and its more important forms.

(c) The Drama.

The characteristics of dramatic poetry, and the most common forms of the drama.

II. An intensive study of the prescribed selections from a two-year cycle:

**First Year of the Cycle (Second Series)**

**A. Poetry.**

Shakespeare: *Macbeth*.

Milton: *Il Penseroso*.

*L'Allegro*.

*Lycidas*.

*Comus*.

Byron: *Lachin y Gair*.

Arnold: *Memorial Verses*, 1850.

Dryden: *Alexander's Feast*.

Wordsworth: *Nature and the Poet*.

*Lines Composed a Few Miles Above Tintern Abbey*.

Browning: *The Epistle of Karshish*.

**B. Prose.**

Ruskin: *Crown of Wild Olive* (Work, Traffic, War.)

Carlyle: *Essay on Burns*.

**Second Year of the Cycle (First Series)**

**A. Poetry.**

Shakespeare: *King Lear*.

Milton: *Paradise Lost* (Book I).

Keats: *Ode to a Grecian Urn*.

Byron: *The Bull Fight* (from *Childe Harold*, Canto I).

Shelley: *Ode to the West Wind*.

Arnold: *Dover Beach*.

Dryden: *Song for St. Cecilia's Day*.

Wordsworth: *Ode on Intimations of Immortality*.

Browning: *Andrea del Sarto*.

*The Guardian Angel*.

**B. Prose.**

Ruskin: *Sesame and Lilies*. (Kings' Treasuries and Queens' Gardens.)

Carlyle: *Essay on Scott*.

III. Supplementary Literature.

The books contained in the following two-year cycle are for individual reading by the student under the guidance and direction of the teacher.

**First Year**

Shakespeare: *The Tempest*.

Lytton: *Harold*.

Stevenson: *Travels with a Donkey*.  
Gaskell: *Cranford*.

### **Second Year**

Shakespeare: *A Midsummer Night's Dream*.  
Lytton: *The Last of the Barons*.  
Stevenson: *An Inland Voyage*.  
Gaskell: *Cranford*.

### **\*Recommended (for both years)**

Thackeray: *Henry Esmond*.  
Barrie: *The Little Minister*.  
Bronte: *Jane Eyre*.  
Trollope: *Barchester Towers*.  
Hemon: *Maria Chapdelaine*.

\*The recommended list is suggestive only. A large number of pupils will read widely outside the compulsory list. The teacher will direct the attention of his classes to these additional books and encourage all pupils to read at least some of them.



# ENGLISH

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## COMPOSITION

The values and aims of the study of Composition may be stated as follows:

1. The use of the English language as an intellectual instrument, which facilitates and conditions thought.

Those speech habits of the student which are suited to the ordinary affairs of his everyday life must be shaped and moulded into an accurate and flexible instrument for his intellectual activities.

2. The use of the English language as a medium of communication.

Each High School student should be trained to develop the best command of his mother-tongue possible for him. He should acquire, and even master, the art of expression in speech and writing. He should be led to discover the essential principles of a good style of speech or writing, and be encouraged to develop, in his own style, distinction and personality.

In pursuing both the foregoing aims the student's vocabulary should receive directive attention:

- (a) By increasing his capital stock of words;
- (b) By securing increased accuracy and precision in diction;
- (c) By developing the habit of interrelating words in differing contents so as to produce consecutive thinking.

### **Suggestions to Improve the Standard of English.**

Teachers of English, by means other than formal instruction, can do a great deal to offset the bad effects of out-of-school influences. Three suggestions may be offered:

(1) There is an old saying that "language is caught, rather than taught." If this saying be true, then the conscientious teacher should strive constantly to place the pupil in an atmosphere of good English. No influence is more potent than that of the inspiring personality of the good teacher of his mother-tongue. The language of the class should be a model which the pupil can follow with absolute faith. Correctness of pronunciation, good choice of words, flawless construction of sentences, freedom from slang and coarseness, are qualities that should characterize the speech of the teacher who wishes to set his pupils an example in good English.

(2) Equally powerful among the pupils of High School age is the influence of an "ideal of good English." It is true that many will be found who will prefer to use "smart" rather than "good" English, but this is only a passing phase, and too much importance should not be attached to it. There are endless ways

of setting up an ideal among classes. It will be found, however, that the final result is attained not by any one method but by a combination of many. Pupils should be led by whatever means the teacher finds most effective, to see that one of the distinguishing marks of the educated person is refinement in language—the ability to use “good English.”

(3) All teachers realize that the use of good English cannot be taught successfully by one department alone. The time is too short. With less than ten hours per week, little can be accomplished without the co-operation of all the other departments. The use of good language is a habit. Very frequently the pupil comes to school with bad habits of expression firmly established. It will require the united effort, during every school hour, of all the teachers in a school to overcome these. Principals, therefore, should require the teachers of other subjects to co-operate with the English department in both written and oral English. Each individual teacher should be made responsible for the spelling in his own subject, and for the mechanics of English in all written work. He should also be required to give attention to obvious matters of good usage in the oral exercises of his pupils.

## COMPOSITION AND RHETORIC

### Divisions of the Subject.

The subject of Composition divides itself naturally into written and oral expression, but the teacher of Composition should avoid introducing any marked separation between the two aspects of the subject. Oral and Written Composition are simply different phases of the same fundamental process, and the two divisions of the subject should be taught concurrently by the teacher.

### Written Expression.

#### *Specific Aims.*

Certain specific aims are to be kept in mind in the teaching of Written Composition.

(1) To lead the pupil to form an ideal of correctness in the details of written expression; namely, a firm and legible handwriting, correctness of grammar and idiom, freedom from slang and coarseness, and the observance of the ordinary rules for capitals and punctuation.

(2) To develop in the pupil the ability to write a clear and effective paragraph on familiar subject matter, with a proper observance of the mechanics of composition and the laws of paragraph structure.

(3) To develop in the pupil the power to write a friendly or business letter or other type of correspondence, correct in form, appropriate in tone and effective in expression.

(4) To develop in the pupil the ability to analyze and make an outline of a piece of literature, and to understand and appreciate the elementary principles that guided the author in its composition.

(5) To develop in the pupil the ability to make, after due time for study and preparation, an outline for a composition on a

suitable subject, and to expand it into a clear, coherent, and readable product.

(6) To develop in senior pupils the ability to write a paragraph or longer composition with adaptation to purpose, and with some vigor and individuality of style.

### **Oral Expression.**

#### *Specific Aims.*

The most important specific aims in the teaching of Oral Composition may be summed up as follows:

(1) To increase the pupil's power to answer clearly, succinctly, and to the point, a question on which he has the necessary information.

(2) To develop in the pupil the ability to say whatever he may have to say with correct pronunciation and clear enunciation.

(3) To develop in the pupil the ability to collect material on a subject of interest to him, to organize it into a suitable form, and to present it effectively to a class, or a club, or any other group.

(4) To train the pupil to contribute his share to informal discussion and conversation without embarrassment, arrogance, or discourtesy to others.

(5) To give the pupil confidence in himself, so that he will be able to take part creditably in any public speaking to which the average High School student may be called.

### **The Time-table in English.**

As far as possible, the teaching of Literature and of Composition in the same class should be done by the same teacher. While for purposes of instruction and examination these two subjects must be separated to secure the best results, they are, nevertheless, vitally connected. Literature is English for leisure, Composition is English for work. The necessary unity and co-ordination can be secured by assigning to one teacher all the English subjects of a class. No instructor, however, should have more than three classes in Composition at any one time. Principals should so plan their time-tables that the teacher will be able to demand from his pupils the number of written exercises necessary to achieve satisfactory results without the expenditure of an unreasonable amount of energy in the correction of exercises.

### **Methods in Written Composition.**

There are three methods of teaching Written Composition which are more or less clearly defined. The first is that which requires the pupil to read good models and to strive to imitate them in his written themes. The second method encourages the pupil to write in his own way, and then seeks through the process of correction of errors to teach him to discover the principles of Composition and to apply them in his further attempts at expression. The third method, at the outset, gives instruction in the rules of Composition and the principles of Rhetoric, and requires the pupil to employ them in his writing. These may be called the imitative, the inductive, and the deductive methods of teaching Composition. The good teacher of Composition will not make exclusive use of any one method of giving instruction in the subject. He will

probably use a combination of all three methods or he may use different methods for different stages in the pupil's development. In one point, however, he must make no mistake. *No amount of reading or formal teaching of the principles of Rhetoric will take the place of practice in writing.*

### **The Nature of the Theme in Composition.**

People express themselves best about the things with which they are familiar, and in which they are interested. The teacher of Composition should keep this truth constantly in mind in assigning themes for pupils. For the most part, subjects should be chosen within the range of the pupil's knowledge, and as far as possible should have an individual or personal interest for him. Care must be taken, however, not to prescribe themes so simple in their nature and so hackneyed that the writer will look upon them with the contempt due to familiarity. In making an assignment for a class, it will be best to choose a number of properly graded subjects, and to allow the individual members to select for themselves the one which makes the greatest appeal. This will ensure that the factors of familiarity and interest will be given an opportunity of exerting their influence towards securing effectiveness and individuality in the finished product.

The teacher of any technical course has a special task to perform in giving instruction in the subject of Composition. It will be necessary for him to keep constantly in mind the special bent of his classes, and to give to his teaching the bias necessary to make it appeal to the interests of his pupils. The teacher of the Commercial class, for example, is fitting pupils to take their places in the business world. His instruction in Composition, therefore, should aim to appeal to practical interests. Many themes should be chosen from current events of a social or political nature, or from subjects having a close and vital connection with business, industry, or commerce.

It is not to be inferred, from what has been said, that the pupil should not be required to prepare themes on any subjects but those with which he is fairly familiar. On occasion, when the necessary time is given for research and preparation, he should be expected to write long essays on topics with which he is relatively unfamiliar. In order to secure a sustained development of the thought in exercises of this kind, it is advisable for the teacher to insist on a topical outline.

### **The Manuscript.**

No manuscript should be accepted which is palpably defective in neatness, spelling, grammar, or paragraphing. The teacher should also teach some simple but effective way of endorsing a manuscript, and should insist on uniformity in this respect. Pupils should be required to keep for inspectional purposes the themes which they prepare during the year. A simple method is to require that all essays be submitted on paper from a loose-leaf Composition book. When the essay is returned by the teacher it is replaced by the pupil in his Composition book, which thus serves as a record of the work accomplished during the year.



## **Motivation in Written Composition.**

It is a very difficult matter for some pupils to see that certain forms of practice in Composition will be of any value to them in after-life. As far as possible, this difficulty should be removed by surrounding the work in Composition with an appearance of reality. Instead of being assigned the general task of writing a letter applying for a position, immensely superior results may be obtained by giving the more specific exercise of applying for a situation advertised in the morning paper. Instead of being asked to write an essay on "How I could earn my own living if I were to leave school now," a pupil might be required to write an *article* on the same subject for *insertion in the school paper*. It is difficult to realize the effect on the exercise or theme of the average High School student produced by supplying some simple motive which gives to the task all the appearance of reality.

## **Importance of Oral Composition.**

As oral expression is put to a vastly greater use than written expression, it follows inevitably that it should occupy a large share of the time devoted in school to Composition. Sir Henry Newbolt says: "We wish, therefore, very strongly to insist that training in continuous oral expression should be brought to the front as the most indispensable part of the school course. Without it the junior classes will fail in their object of 'grounding' the children. The senior classes, also, will find that their teaching of English will have but ill-balanced results if all the speaking is done out of school, all the reading and writing in school. Here, in addition to dramatic work, debates and brief 'lectures' by the pupils themselves may be found helpful. Oral work is, we are convinced, the foundation upon which proficiency in the writing of English must be based; more than that, it is a condition of the successful teaching of all that is worth being taught."

## **Choice of Subjects in Oral Composition.**

Familiarity with and interest in subject-matter have already been mentioned as the pre-requisites of good expression. It is in the field of Oral Composition that the truth of this principle is particularly evident. Except for short reports which the teacher may require the pupils to make from time to time on special questions of class interest, the choice of subjects for Oral Composition may very well be left in the hands of the pupils themselves, subject, of course, to approval. Only in the case of the student who is unable to decide on what matter he should give his talk, should it be necessary to prescribe a topic. Short stories may be suggested for students who have no hobbies.

## **Sympathy of the Teacher.**

Many students find the assignments in Oral Composition rather a severe ordeal. They are temperamentally shy, and it is only by a sheer effort of the will that they can "screw their courage to the sticking point" and face their classmates. The sympathy of the teacher will go a long way to give encouragement to this type of student. Even in the event of failure, the criticism should be mild and aim to remove any feelings of humiliation on the part



of the speaker. In some cases, criticism should be withheld altogether. On the whole, first attempts at class speeches should be marked liberally and criticized leniently.

## SPELLING

Although Spelling is given a separate place only in the Commercial course, it does not follow that little importance is attached to it. On the contrary, it will occupy a large place in the scheme of the teacher of English. Instruction in the subject, however, will be largely incidental. Pupils should be required, as far as practicable, to correct their own mistakes by the use of the dictionary.

Every teacher of English should keep lists of the words which are mis-spelled by his classes, and from time to time give tests in them to ensure that the correct spelling has been learned. Further, each pupil should be required to keep for himself a list of the words with which he has difficulty. A good list for the teacher would be one compiled from all the lists of a class or school.

Principals should make instructors in other departments responsible for the spelling of classes in their own subjects. Without strict attention to spelling from every department of the school, the labors of the teacher of English will largely be in vain.

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## ENGLISH 1

### COMPOSITION

#### Details of Course.

*N.B.*—Exercises of the pupils should be carefully preserved for examination by the Inspector on the occasion of his visit.

1. Meaning of the term.
2. The two main divisions of composition.
  - (a) Poetry.
  - (b) Prose.
3. Difference between poetry and prose.
  - (a) As to form.
  - (b) As to thought.
4. Forms of prose composition.
  - (a) Oral.
  - (b) Written.
5. Kinds of prose composition.
  - (a) Narration.
  - (b) Description.
  - (c) Exposition.
  - (d) Argument.

6. The units of prose composition.

- (a) The word.
- (b) The sentence.
- (c) The paragraph.
- (d) The whole composition.

7. The paragraph.

- (a) What a paragraph is.
- (b) The mechanical arrangement of the paragraph.
  - (i) Indentation.
  - (ii) Spacing.
- (c) Two main kinds of paragraphs.
  - (i) Isolated.
  - (ii) Related.
- (d) The rhetoric of the paragraph.  
The principles of paragraph structure.
  - (i) The topic sentence.  
What is meant by the topic sentence.  
The law of the topic sentence.  
The place of the topic sentence in the paragraph.  
Omission of the topic sentence.
  - (ii) Unity.  
What is meant by unity in the paragraph.  
The law of unity.  
Relation between the law of unity and the law of the topic sentence.  
The test of unity.
  - (iii) Coherence.  
Meaning of the term.  
The law of coherence.  
Devices for securing coherence.
    - (1) Regularity of thought development.
    - (2) Apt use of connective words (transition).
    - (3) Parallel construction.
  - (iv) Emphasis.  
The need of emphasis.  
The law of emphasis.  
Devices for securing emphasis in a paragraph.
    - (1) By means of regulating the space devoted to ideas.
    - (2) By means of giving the proper position to prominent ideas.
    - (3) Other devices.
- (e) Application of the principles of paragraph structure in the writing of isolated paragraphs.
- (f) Transition in related paragraphs.

8. Capitalization.

9. Abbreviations.

10. Punctuation.

Uses of period, interrogation mark, exclamation mark, comma, semicolon, colon, dash, apostrophe, single quotation marks, double quotation marks, parentheses, brackets, hyphen.

11. The whole composition.

- (a) As narration.
- (b) As description.
- (c) As exposition.
- (d) As argument.

12. How to plan a whole composition.

13. The principles of unity, coherence, and emphasis, applied to the whole composition and in particular to narration.

The methods of narration.

Narration in the first and third persons.

14. The sentence.

Definition of a sentence.

Review of classification according to—

(a) Meaning.

(b) Form.

Analysis of sentences, detailed and clausal.

The use of correct grammar in sentences.

Review of inflection necessary for the use of correct grammar with emphasis on—

- (i) Plural of nouns, possessive of nouns.
- (ii) Agreement of subject and predicate.
- (iii) Correct case form of the pronoun.
- (iv) Correct principal parts of the verb, *e.g.*, lie, lay, lain; lay, laid, laid.
- (v) Correct form and use of adjectives and adverbs commonly confused; *e.g.*, good, well; bad, badly.

15. The friendly or personal letter.

Emphasis should be placed on the body of the letter.

(a) The paper.

(b) The parts of the letter.

- (i) Heading.
- (ii) Complimentary address, when used.
- (iii) Salutation.
- (iv) The body.
- (v) The complimentary close.
- (vi) The signature.

(c) The envelope.

The personal element in the letter.

16. Oral Composition (to be taken concurrently with written Composition).

- (a) The plan of a speech.
- (b) Deportment.
- (c) Pronunciation.
- (d) Enunciation.
- (e) Correct English.

Practice in Oral Composition.

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## ENGLISH 2

### COMPOSITION

*N.B.*—Exercises of the pupils should be carefully preserved for examination by the Inspector on the occasion of his visit.

#### 1. The Paragraph.

Review of the principles of paragraph structure taught in the first year.

Exercises in writing isolated paragraphs.

Further classification of paragraphs according to their use—

(1) Isolated.

(2) Related.

(a) Introductory.

(b) Transitional.

(c) Developing.

(d) Summarizing.

Exercises in the different kinds of paragraphs.

#### 2. The whole Composition.

Review of the three fundamental principles of rhetoric as applied to narration, description, exposition and argument.

Review of the principles of narration.

Exercise in more advanced narration.

#### 3. A particular study of description.

Material of description.

The point of view in description.

(1) Physical or local.

(2) Mental or emotional.

Kinds of description.

(1) Scientific.

(2) Artistic.

The first general impression.

Selection and arrangement of details in description.

Harmony in description.

Exercises in scientific and artistic description.

Descriptive narrative.

#### 4. The Sentence.

Grammar of the sentence continued with attention to more difficult analysis of sentences, detailed and clausal.

Recognition of parts of speech and simple parsing, with special attention to—

- (1) The case of nouns and pronouns.
- (2) The agreement of subject and predicate.
- (3) The relation between pronoun and antecedent.
- (4) The correct use of personal, indefinite and demonstrative pronouns.
- (5) The correct use of verb forms with special reference to principal parts, auxiliaries of tense and sequence of tenses.

General study of correct forms of speech and the grammatical basis for them.

#### 5. The Word.

- (a) The general principles of syllabication.
- (b) The use of the dictionary.

#### 6. Correspondence.

- (1) Review of friendly letters with particular attention to interest and the personal element.
- (2) Business letters with particular reference to the following types:
  - (a) Remittance.
  - (b) Application.
  - (c) Introduction.
  - (d) Recommendation.
  - (e) Ordering.
  - (f) Inquiries.
- (3) Further social correspondence including formal and informal invitations and replies.
- (4) Business forms including the receipt, note, cheque, money order, draft, telegram, cablegram, etc.
- (5) Advertisements.

#### 7. Oral Composition (to be taken concurrently with Written Composition.) More advanced instruction in Oral Composition.

- (1) Considering the audience.
- (2) Holding attention.
  - (a) Use of the voice.
  - (b) Use of gesture.
  - (c) Directness of speech.

Practice in Oral Composition.



## ENGLISH 3

### COMPOSITION AND GRAMMAR

*N.B.*—Exercises of the pupils should be carefully preserved for examination by the Inspector on the occasion of his visit.

#### A. Composition.

1. The whole composition.

Review and more advanced study of narration and description.

Exercises and themes in narration and description.

Review of business correspondence.

2. Exposition.

Meaning of the term.

Kinds of exposition.

Methods of exposition.

Exposition by narration and description.

Exercises and themes in the various kinds of exposition.

3. Argument.

Application of the term.

Relation between exposition and argument.

The division of an argument.

Finding the issue.

The plan of an argumentative essay—

(1) The proposition.

(2) The brief.

(a) The introduction.

(b) The body or proof.

(c) The conclusion.

Proof and evidence.

Kinds of reasoning.

Fallacies in reasoning.

Exercises and themes in argument.

4. The rhetoric of the sentence continued.

Review of the principles of unity, coherence and emphasis as applied to the sentence.

Classification of sentences according to length.

(1) Long.

(2) Medium.

(3) Short.

Rhetorical qualities and uses of these classes of sentences.

Classification of sentences according to structure—

(1) Loose.

(2) Periodic.

(3) Balanced.

Rhetorical qualities and use of loose, periodic and balanced sentences.

Parallel construction.

Clearness in the sentence.

Causes leading to lack of clearness.

Force in the sentence.

Method of securing force in the sentence.

Beauty of elegance in the sentence.

How obtained.

Variety in sentence.

## 5. Diction.

Meaning of the term.

What is meant by good choice.

Importance of good choice.

Meaning of terms: literary use, colloquial use, vulgar use.

Wrong use of words:

(a) Improper abbreviations.

(b) Slang.

(c) Colloquialisms.

(d) Foreign words.

(e) Newly-coined words.

(f) Obsolete words.

(g) Poetical language.

Vocabulary-building.

General principles of choice.

(a) Correctness.

(b) Precision.

(c) Appropriateness.

(d) Expressiveness.

Study of synonyms, antonyms, and homonyms, as an aid to choice.

Study of Anglo-Saxon words and classical derivatives as an aid to choice.

A study of the figures of speech sufficient to make clear their effect on clearness, force and beauty as qualities of style—

Simile, metaphor, personification, synecdoche, metonymy, exclamation, interrogation, antithesis, climax, anticlimax, irony, hyperbole, euphemism, alliteration.

## 6. Oral Composition (to be taken concurrently with Written Composition) with emphasis on debating.

The divisions of the formal speech.

(1) Introduction.

(2) The discussion.

(3) The conclusion.

The purpose of the introduction.

Effectiveness in discussion.

Methods of ending a speech effectively.

The debate.

- (1) Choice of subject.
- (2) The phrasing of the proposition.
- (3) Arrangement of speakers and division of time.
- (4) Parliamentary procedure.
- (5) Refutation.

Practice in formal and class debate.

## B. Grammar.

As in authorized text—

Stevenson and Kerfoot: *Ontario High School Grammar*.

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# ENGLISH 4

## COMPOSITION

### 1. Narration.

- (1) Advanced study of narration, with a view to securing an effective product.

Emphasis should be laid on—

- (a) Choice of material to arouse interest.
- (b) The introduction as a means of arousing interest.
- (c) Methods of holding interest-motivation.
- (d) Simple and plot narration.
- (e) The short story. Its requisites.
- (f) Action in narration.
- (g) Introduction of characters in narration.
- (h) Conversation in narration.
- (i) The tests of unity, coherence and emphasis applied to the narrative.
- (j) The use of description, exposition and argument, in narration.

### (2) Narrative themes.

### 2. The qualities of the finished product.

- (a) Clearness in the sentence, paragraph and whole composition. How secured.
- (b) Force in the sentence, paragraph and whole composition. Methods of securing force; interest.
- (c) Elegance or beauty in the sentence, paragraph or whole composition. Its connection with diction and the form of the sentence.
- (d) The personal touch in composition.

### 3. Description.

- (a) Further study of description with emphasis on the following:

- (i) The point of view.
  - (1) Local.
  - (2) Mental and emotional.

- (ii) The importance of the first general impression.
- (iii) Artistic or literary description.
- (iv) Kinds of artistic or literary description.
- (v) The grouping of details—coherence.
- (vi) The grouping and wording of important details for proportion.
- (vii) Methods of securing emphasis.
- (b) Exercises and themes in description.

#### 4. The rhetoric of the paragraph.

- (a) Advanced study of the principles of paragraph structure with a view to securing a more effective product.
  - (i) The topic. Its repetition.
  - (ii) The summarizing sentence.
  - (iii) The relation of the topic sentence to the method of paragraph development.
  - (iv) Methods of developing the topic sentence.
  - (v) Choosing the best method.
- (b) Exercises and themes in the paragraph.

#### 5. Exposition.

- (a) Further study of exposition with a view to securing effectiveness in the product.
  - (i) The means of exposition.
    - (1) By definition.
    - (2) By analysis.
  - (ii) Limiting the subject.
  - (iii) Special forms of exposition.
    - (1) Of character.
    - (2) The abstract.
    - (3) Literary criticism.
    - (4) The editorial.
  - (iv) The outline in exposition.
- (b) Exercises and themes in exposition.

#### 6. Diction.

- (a) A further study of diction with particular emphasis on—
  - (i) Good use.
  - (ii) Violations of good use—
    - Barbarisms, vulgarisms, improprieties, slang.
  - (iii) The right word for clearness.
  - (iv) The right word for elegance.
  - (v) Euphonious words.
- (b) Application of the principles of good diction in the writing of themes.

## 7. Argument.

### (a) More advanced study of argument.

- (i) The raw material.
- (ii) What constitutes evidence.
- (iii) The commonest kinds of reasoning.
  - (1) Inductive.
  - (2) Deductive.
  - (3) By analogy.
- (iv) Other forms of reasoning.
- (v) Formal argumentation—The debate.
- (vi) The Brief. Its use, parts and form.
- (vii) Rebuttal.

### (b) Exercises and themes in formal and informal argumentation.

## 8. Oral Composition. (To be taken concurrently with Written Composition.

Particular attention should be given to the following with a view to securing effectiveness and finish in the oral product.

- (a) Oral diction.
- (b) Oral phrasing.
- (c) The importance of brevity.
- (d) Emphasis.
- (e) Rate of speaking.

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# HISTORY OF ENGLISH LITERATURE

To supplement and unify the regular course in English, the History of Literature has been included as an optional subject in the fourth year. This subject includes the study of English Literature from Anglo-Saxon times to the present day. The period from the beginning until the accession of Queen Elizabeth is to be treated in outline only. The period from the time of Queen Elizabeth to the present is to be studied as intensively as the prescribed text will permit.

In the course in History of Literature, considerable emphasis should be placed on prominent movements and tendencies. The authors studied should be related to their particular period and to the movement or tendency which they represent. An author's works are more important than his life. The latter should be studied mostly for the purpose of making clear the exact nature of his accomplishment and his importance in history. Personal characteristics and external conditions should be noted so far as they have a bearing on these points. Furthermore, the study of an author's works should precede the study of his life. It is better for the pupil to read an author himself than to read merely about him.



The pupil should be led to apply what he learns in this course to the subject-matter he has previously studied. The literature taken in English 1, 2, and 3 should now fall naturally into its proper setting. By the time the pupil has completed his fourth year course he should be able to place the whole range of the course in English Literature in its true historical perspective.

Considerable attention should be given to the "Readings" in Part II of the text. Pupils should be familiar with at least one selection from each author.

1. A study in outline of English Literature, from the beginning to the accession of Queen Elizabeth.

I. From the beginning to the Norman Conquest.

(a) Anglo-Saxon poetry.

The oldest English poem.

"Beowulf."

Caedmon and Cynewulf.

Characteristics of Anglo-Saxon poetry.

(b) Anglo-Saxon prose.

Beda, Alfred the Great, Anglo-Saxon Chronicle.

II. From the Norman Conquest to the death of Chaucer.

The Normans and the effect of the Norman Conquest on the English language and literature.

The Arthurian Legends and other Romances.

Geoffrey of Monmouth, Mandeville.

Religious writers.

Wiclif, Langland.

Chaucer (his life, works and influence).

III. From the death of Chaucer to the accession of Elizabeth.

(a) The literature of the Fifteenth Century.

The "popular" ballad.

William Caxton and the introduction of printing.

Thomas Malory and *Morte d'Arthur*.

(b) The Renaissance. The nature of the movement.

Wyatt and Surrey, and the Italian influence.

Tyndale.

Readings from the prescribed text: "Beowulf" ("The Fight with Grendel's Mother"); Caedmon, "In the Beginning" (from the paraphrase); Cynewulf, "The Choice of Mortals" (Christ, Part II, the Ascension); Beda, "Preface to the Ecclesiastical History" and "The Coming of the Anglo-Saxons and Jutes"; Alfred the Great, "Preface to Pope Gregory's Pastoral Rule"; Extract from the Anglo-Saxon Chronicle; Middle English Romance, "Gawain Keeps His Pledge"; Geoffrey of Monmouth's "Arthur's Bravery"; John Wiclif, "The Beatitudes"; William Langland, "The Vision of the Field Full of Folk"; Sir John Mandeville, "The Land of Prester John"; Chaucer, "Portrait of the Nonne" and the "Pardoner's Tale"; Popular Ballads, "Sir Patrick Spens"; "Bonnie George Campbell," "Robin Hood's Death and Burial"; Caxton, "Preface to Transla-

tion of Aeneid"; Sir Thomas Malory, "How Arthur Was Chosen King"; Wyatt, "How the Lover Perisheth in His Delight as the Fly in the Fire"; Surrey, "Description of Spring"; Tyndale, "The Beatitudes."

2. A thorough study of English Literature, from the accession of Elizabeth to Ruskin's death.

I. From the accession of Elizabeth to the Closing of the Theatres.

The preparatory period.

Characteristics of the Elizabethan period.

Life, work and place in literature of John Lyly, Sir Philip Sidney, Edmund Spenser, Francis Bacon.

The Drama.

Origin and early history of the drama.

The Elizabethan Theatre.

The three great Elizabethan dramatists: Marlowe; Shakespeare; Jonson. Their places in the history of the drama.

The "King James Bible."

Readings from the prescribed text: Lyly, "Queen Elizabeth"; Sidney, "Description of Arcadia"; Spenser, "Una and the Lion"; Bacon (choice of two essays); Marlowe, "A Boast of Tamburlaine" and "The Passionate Shepherd to His Love"; Shakespeare, "When in Disgrace with Fortune and Men's Eyes," "Let Me Not to the Marriage of True Minds"; Jonson, "Song to Celia," "To the Memory of My Beloved Master William Shakespeare."

II. From the Closing of the Theatres to the Restoration of Charles II.

The rise and influence of the Puritans.

The Royalists and literature.

The Cavalier Poets and their characteristics.

Lovelace, Suckling, Carew, Herrick.

The life, work and influence of Milton.

Sir Thomas Browne.

Readings from the prescribed text: Herrick, "Corinna's Going A-Maying," "Cherry-Ripe"; Carew, "In Praise of His Mistress," "Disdain Returned"; Lovelace, "To Lucasta, on Going to the Wars," "To Althea, from Prison"; Milton, "Il Penseroso," "L'Allegro," "Truth and Conformity"; Sir Thomas Browne, "Heaven and Hell."

III. From the Restoration of Charles II to the death of Dryden.

The reaction against Puritanism.

The life, work and place in literature of Samuel Pepys; John Dryden; John Bunyan.

Readings from the prescribed text: Pepys, "Extracts from Diary"; Dryden, "MacFlecknoe"; Bunyan, "The Trial of Christian and Faithful."

#### IV. From the death of Dryden to the publication of "Lyrical Ballads."

General characteristics of Eighteenth Century literature.  
The two divisions of the period.

(a) The age of Pope.

Literary standards of the age.

A study of the lives, works, and place in literature of Jonathan Swift; Daniel Defoe; Richard Steele; Joseph Addison; Alexander Pope; James Thomson.

(b) The age of Johnson.

Johnson's literary standards and the new tendencies.

A study of the lives, works, and place in literature of Samuel Johnson; James Boswell; Oliver Goldsmith; Edmund Burke; William Collins; Thomas Gray; William Cowper; Robert Burns.

The rise of the novel and its relation to the romance.

The early novelists: Richardson; Fielding; Smollett; Sterne.

Other novelists before 1800.

Readings from the prescribed text: Swift, "The Spider and the Bee"; Defoe, "The Education of Women", Extracts from "Robinson Crusoe"; Steele, "Mr. Bickerstaff Visits a Friend," "The Editor's Troubles"; Addison, "Marlborough," "The Vision of Mirza"; Pope, memorable couplets from his Poems; Thomson, "Winter," "Spring" (from "The Seasons"); Johnson, "Letters to the Earl of Chesterfield and James Macpherson," "Dissertation on the Art of Flying"; Boswell, "First Meeting with Johnson," "Character of Goldsmith"; Goldsmith, "The Village Preacher," "The Village Schoolmaster," "Elegy on the Death of a Mad Dog"; Burke, "The Proper Attitude Towards America"; Collins, "Ode (1746)," "Ode to Evening"; Gray, "Elegy"; Cowper, "On Human Slavery," "Sonnet to Mrs. Unwin"; Burns, "Tam O'Shanter," "Flow Gently, Sweet Afton."

#### V. From the publication of the Lyrical Ballads to the death of Ruskin.

The two divisions of the Nineteenth Century.

(a) The age of Romanticism.

The characteristics of Romanticism and the extent of the movement.

Life, works and relation to the Romantic movement of the following poets: William Wordsworth, Samuel Taylor Coleridge, Lord Byron, Percy Bysshe Shelley, John Keats.

Life, works and relation to the Romantic movement of the following prose writers: Charles Lamb, Thomas de Quincey, Sir Walter Scott. Jane Austen.

(b) The Victorian age.

Characteristics of the Victorian age.

A study of the following prose writers and their place in literature: Thomas Babington Macaulay, Thomas Carlyle.

A study of the following prose writers and their place in history, with particular reference to the novel: Charles Dickens, George Eliot, William Makepeace Thackeray.

VI. Contemporary Literature. Since 1900.

(a) Chief tendencies of contemporary literature.

(b) Modern Poetry.

Life, works and relation to modern literature of the following poets: Rudyard Kipling, John Masefield, Alfred Noyes, Robert Bridges, Wilfred Wilson Gibson.

(c) The Modern Novel.

Life, works and relation to modern literature of the following novelists: George Meredith, Thomas Hardy, Herbert George Wells, Arnold Bennett, Joseph Conrad, Sir James Matthew Barrie, John Galsworthy, Hugh Walpole.

(d) The Modern Drama.

Characteristics of the modern drama.

Study of the following dramatists: Sir James Matthew Barrie, John Galsworthy, William Butler Yeats, John Synge.

The Satirists of the Modern age: George Bernard Shaw.

(e) The Essayists of the Modern age: Gilbert Keith Chesterton, Hilaire Belloc, and Max Beerbohm.

(f) A Study of Modern Biography and Criticism as exemplified in Lord Morley, Lytton Strachey, Mrs. Asquith, George Moore, and Sir A. T. Quiller-Couch.

(g) Characteristics of the "New School" of poetry.

(h) Poetry of the Great War.

Readings from the prescribed text: Kipling, "Fuzzy-Wuzzy," "Recessional"; John Masefield, "Sea Fever," "Cargoes"; Alfred Noyes, "A Song of Sherwood"; Yeats, "The Lake Isle of Innisfree"; Wilfred Wilson Gibson, "Snug in My Easy Chair"; Newbolt, "Messmates"; John Drinkwater, "A Town Window"; Walter De La Mare, "The Listeners"; Richard Adlington, "Images"; Siegfried Sassoon, "Aftermath"; Winifred M. Letts, "The Spires of Oxford"; Rupert Brooke, "The Soldier"; Wells, from "Mr. Britling Sees It Through"; Galsworthy, "The Caradoc Family"; Belloc, "On Dropping Anchor."



# FOREIGN LANGUAGES

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## THE CLASSICS

### **Introduction:** Aims, Values, and Methods.

Apologists for the classical studies have been compelled to shift their ground of defence by the results of present-day experimental work in psychology and pedagogy. The time-honored doctrine of "formal discipline" has now become untenable as a defence for the study of the Latin and Greek languages, and the psychology of special abilities seems to show that languages, whether ancient or modern, are not to be included in that small group of subjects which any and every student can "take" with profit. Indeed, experimental evidence seems amply to establish the truth of what many earnest classical teachers have long suspected, viz., that of the thousands who have during the countless generations submitted themselves, with more or less grace, to the classical regimen, but few—far too few—have ever made sufficient progress to justify the great cost in time and effort required. And the pages of our educational journals have been filled with wordy polemics between, on the one hand, those detractors of the Classics who see in Latin and Greek nothing but so much effete rubbish which, every scrap of it, should be cleared away forthwith from our curriculum, and, on the other hand, those valiant champions of the classical tradition who maintain that no one can lay claim to the rudiments of liberal culture without having at least a tincture of the "humanities."

But this age-long controversy has now largely ceased to be of great practical importance, because of the fact that our older rigid types of curricula have been superseded, to a large extent, through the introduction of options and elective courses, where every student may find the curricular material which is best suited to his individual tastes, abilities, and requirements. While, of course, it is true that Latin is still required for entrance to some of the university faculties, notably those of Law and Medicine, it must be pointed out that Greek has long ceased to be an entrance requirement at Canadian or American universities, and that it seems only a matter of time until Latin, likewise, will disappear from the list of compulsory requirements, all that holds it being a rather stubborn survival of mediaeval tradition. Even where the retention of Latin can be urged on grounds of practical utility, as, for example, in Law or Pharmacy, it has been found expedient to replace the traditional discipline of Caesar and Virgil, Cicero and Horace, with a special study of "pharmaceutical Latin" or of "legal Latin." Many excellent lawyers whose Latinity has none of the polish of Livy or of Cicero possess a very serviceable knowledge of "juristic Latin"; and, conversely, many a student who has spent years assiduously thumbing his Latin dictionary, in almost



daily contact with the elegance of Cicero's idiom, cannot recognize the meaning of such common phrases as *e pluribus unum* or *per aspera ad astra*. And so it comes about that, because of the failure of their formal training and the lack of their practical utility, the classical languages have forfeited their right to a place amongst the compulsory subjects of a modern High School course.

This apparent catastrophe in the field of classical studies will, it is generally thought, be productive of much good in the long run; for the Classics are no longer paraded under false colors, but have been assigned a place amongst the optional subjects of the secondary curriculum in keeping with their true merits: always sufficiently great to render that place unassailable, and to preserve for them their pristine glamor, and their value for modern culture. What this place should be can readily be determined when account is taken of the fact that there are still at least *three* classes of our High School students for whom a course of some kind in either or both of the classical languages is indispensable, viz.:

1. Those who desire to enter any of the university faculties that require these subjects for matriculation. For such students, a wide departure from the traditional course for matriculation seems advisable, with a view to realizing more directly the specific aims of the study of Latin or Greek in the faculties for which these subjects are entrance requirements. Furthermore, it is to be hoped that our Canadian secondary schools may co-operate with the universities of the Dominion in standardizing and modernizing these requirements.

2. Those who have a considerable capacity for languages (what is sometimes called "language sense" or *Šprachgefühl*). Such students usually possess either genuine literary ability or a taste for philology and literary culture, and have therefore an inherent right to such preparatory training in their High School course as will fit them for more advanced work at the University in the study and appreciation of the world's great literatures, in the scientific study of comparative literature and literary criticism, in the study of Romance, Teutonic, or classical philology, or for research work in archaeology, anthropology, and ancient culture. Any one who is acquainted with the work of such classicists as Professor Warde Fowler, Professor Gilbert Murray, or Miss Jane Harrison, will readily admit the paramount importance of work in the last-mentioned field for the solution of many of our modern social and sociological problems.

3. Those students who, not having begun Latin or Greek in the junior High School grades, desire in the senior grades a short or one-year course in these languages, such as will strengthen their grasp of the English language by illuminating the work done in English etymology and the history of English. With this could be coupled a treatment of Latin or Greek words and phrases as used in scientific, business, or literary English. Now that English has become one of the great international languages, no aid to its mastery should be overlooked in our High School courses.

Nevertheless, it is the opinion of many educationists that the number of those who study Latin and Greek for vocational purposes, or for instrumental or propaedeutic purposes, is not large

enough to justify a prominent position for the Classics in a modern curriculum. Moreover, it is difficult to maintain that the social and cultural values of classical literature cannot be reached as effectively through the many excellent and scholarly English translations which are now available. If, then, these "direct values," so-called, are limited and contingent, what "indirect values" can be urged in defence of the Classics?

In answer to this question, one may point out the fact that up to the end of the Nineteenth Century language study dominated the secondary curriculum, and that languages are taught largely through the medium of grammar and translation. This procedure was justified on the ground that it developed a general linguistic ability, and provided for a transfer of improved mental efficiency; and it must be admitted that on grounds of psychological theory an excellent case can be made out for the older methods of foreign language study, especially for the study of those languages, like Latin or Greek, which in their inflections or syntax, and in their word order and grammatical structure, depart most widely from English. For language is the instrument of thought as well as the medium of thought communication: it conditions and facilitates thought. And as the intellect expands, the speech habits of everyday life must be refashioned to suit the needs of accurate and precise thinking. It is here that the task of translating from a foreign language widely different from the mother tongue is of undoubted value. It brings home to the young student the distinctive features of his language. Both intrinsic and extrinsic meanings become explicit. The general and approximate meanings of his passive vocabulary are refined by comparison, contrast and careful selection. Under the stress of a felt need, words and phrases whose very familiarity and facility in use are a cloak for vagueness and want of conscious relationing to thought are re-examined; and the attention is fixed on exact definition and fine discrimination. Furthermore, as this training proceeds, a more accurate knowledge of the English sentence, both analytically and synthetically, is developed, and a finer appreciation of phrasal and clausal relations as well.

To be sure, it is an open question whether more time spent on the direct study of English might not produce these results at less cost of time and effort. But, in any case, the conclusion seems necessary that the stronger the case for the Classics becomes on the ground of linguistic training, the weaker is the argument for teaching them by the so-called "direct method."

It is also maintained that the following mental traits involved in the study of Latin are transferable: habits of mental work, the tendency to concentrate and neglect irrelevant elements, ideals of thoroughness, and of accuracy and precision, and certain desirable attitudes towards study and intellectual achievement. While evidence as to the amount of such transfer is far from conclusive, it is safe to say that transfer is certainly not automatic, but depends on the degree to which conditions favorable for dissociation may be set up. The materials of the subject must be organized, manipulated, and presented with the "transfer values" definitely and explicitly in view.

From the foregoing statement it is obvious that, until the true values and legitimate aims of the study of the classical languages can be stated definitively and in psychological terms, we are not likely to achieve any great measure of success in realizing them.

But there are further questions to be considered if one is to frame a course in Latin that will serve modern needs. For one matter, the traditional classical course, for all save those specially endowed with linguistic ability, has been much too difficult. Its very magnificence has appealed only to the intellectual *élite*: to those choice and master spirits "who see at a glance, who immediately understand, and who remember forever." A number of experiments and surveys show that after the beginner's year, when there is a fair degree of ability to understand the meaning of the Latin read, there is very little gain in this ability; and in the senior years the gain is out of all proportion to the time and labor spent. Again, it has been generally assumed that the daily preparation and recitation of Latin lessons contributes to growth in reading power. But experimental results show that there is very little actual transfer from lesson-learning power to meaning-reading power, the learning of Latin lessons being a process quite different from that of sight reading. Indeed, the traditional methods of teaching the Classics tend to develop a deciphering attitude, an ability to solve Latin or Greek puzzles, rather than a reading attitude.

We should, therefore, cease to turn the student loose upon the barren wastes of Caesar, or enmesh him in the toils of the Ciceronian period. Renouncing our worship of the unholy trinity of Caesar, Virgil, and Cicero, we should begin our Latin course with selections so simple that a student may read with some hope of obtaining the meaning by his own efforts. Since the Roman world has not bequeathed to us a series of graded reading lessons suitable for beginners, we must use other reading matter than heretofore even though it be not classic, and lack the flavor of antiquity.

It is also clear that the materials of our courses in Latin and Greek must be recast from the point of view of interest. Means must be found for extending interest in the classical languages, and in classical literature, art, and history. The dry bones of conjugations and declensions must be clothed with language that lives. The reading selections studied must be such as the student will feel to be really human productions, emanating from wonderful people, who, once upon a time, actually had a sublunary existence.

Finally, it is desirable to offer High School courses in Latin and Greek that will do more than attempt merely to lay a foundation for university work. It is highly desirable that such courses be complete in themselves, so that they may have not only a vocational and instrumental value for a select few, but a linguistic and cultural value as well for the greater part of our High School students.

### **The Technique of Teaching**

1. A modified form of the "direct method," so-called, should be employed by all teachers of Latin and Greek.

Although excellent results have been obtained by using the pure direct method, it must be borne in mind that the results of



that method are best in those schools which, in a manner, specialize in languages: preparatory and private schools, that is to say, which employ no teachers but specialists, devote a great deal of time to the language and draw to their classes a superior grade of students. In Alberta, it is doubtful whether such a method would be generally successful. There is no reason, however, why a portion of every lesson in Latin or Greek should not be given to oral work and conversation. Maxims and mottoes could be recited, short stories and stanzas of poetry read aloud and memorized, short plays acted, and songs and rounds sung. A rigid adherence to the "Roman method" of pronunciation seems desirable.

2. The two-unit course in Latin should, where possible, be spread over three years; but, if taken in two years, these should be consecutive.

3. The most satisfactory results can be achieved when the number of students in a class does not exceed *twenty*.

4. Where a portion of a classical work is read in the original, the remainder should be presented to the student in the form of an English translation, or of a summary. A great many of the arguments usually advanced on behalf of the study of the Classics would apply equally well to a study of good English translations. No adequate introduction to classical literature can be obtained from the reading in the original of a few excerpts but from one or two authors. There must be wide reading on the part of the student, and the use of translations will make this possible.

(See Prof. R. G. Moulton's *World Literature*, Introduction. p. iii; and his *Ancient Classical Drama*.)

5. The grammatical part of the course in Latin or Greek should be confined to a minimum of accident, and to the bare essentials of syntax. The study of English Grammar and of Latin Grammar should proceed concomitantly, as also should the study of English word-formations with that of Latin and Greek.

6. If sufficient time is available, attention should be given to the social, political, and religious institutions of Rome and of Greece, and to the main features of classical literature. Some definite knowledge of Greek and of Roman culture, literature, and history should be an integral part of the classical course. Where possible, the work of the Classics department in the High School should be correlated with that of the History department.

7. The use of Sight Translation should be continued as a means of testing the power to read Latin.

8. The memorization of short passages from Latin and Greek of special excellence and literary merit should receive regular attention.

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## LATIN 1

1. This is a first-year course, or beginners' course, based on a minimum requirement of 200 class-room periods. It may be covered in 40 weeks at the rate of five periods per week. The course is designed to be complete in itself.

2. Sixty of the lessons of the text-book are required, which may be covered at the rate of two lessons per week. The five 40-minute class-room periods should be divided as follows:

Three periods for teaching the grammatical material of the two text-book lessons;

Two periods for exercises, accidence drill, vocabulary drill, review lessons, and songs.

3. The building of a Latin vocabulary comprising a good number of fundamental words is of the very essence of this course. At the same time, the correlation of Latin words and English derivatives should receive regular attention. Appendix I and Appendix II of the text-book will be helpful in this respect.

4. The songs given in the text-book should be learned and sung.

5. The memorization of *sententiae*, choice fables, mottoes (such as given in the text-book) and songs, should be required regularly throughout the course. Rote repetition by the class in concert is largely employed in "direct method" courses, and would no doubt be a valuable procedure in this course. Simple questions and *colloquia* should be prepared by the teacher, and the class taught to answer either individually or in concert.

6. Time should be taken in the beginners' class to interest the students in Roman life and history.

7. The correlation of Latin Grammar and English Grammar should receive attention.

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## LATIN 2

This course should give first place to the reading of Latin prose and poetry, the subject-matter and style of which are both easy and attractive. The writing of sentences should occupy a place of second importance.

### A. Latin Grammar.

1. Thorough drill on accidence. Time-limited tests (90% efficiency).

2. Vocabulary drill on selected word lists. Time-limited tests (90% efficiency). Elementary Latin word-building; prefixes and suffixes; composition of verbs, showing vowel changes and consonant assimilation.

3. The major principles of Latin case-syntax:

Accusative: Direct object.

Extent of time and space.

Predicate accusative.

Dative: Indirect object.

After certain verbs and adjectives.

Of agent.

Of the possessor.

Of purpose.



Genitive: Subjective and objective.

Of possession.

Of the whole.

Of description.

With adjectives.

Ablative: Instrument and means.

Cause.

Manner and attendant circumstances.

Quality of description.

Specification.

Separation

Agent.

Comparison.

Degree of difference.

Definite price.

Time.

4. The major construction of Latin prose:

(a) Accusative and infinitive.

(b) Participles and the ablative absolute.

(c) Purpose clauses; adverb and noun.

(d) Result clauses; adverb and noun.

(e) Indirect questions.

(f) Gerund and gerundive.

(g) *Cum* clauses.

(h) Conditional clauses.

■ For prescribed reading in any year see *Regulations for Secondary Schools* for the year in question.

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## LATIN 3

The standard required in this course is that of advanced Matriculation, or of the first year of the University course.

### A. Latin Grammar.

The text-book prescribed is to be used by the student, under the direction of the teacher, as a reference book; but no attempt should be made to cover systematically the text-book as a whole. Attention should be given to the elucidation of such important points in accidence and phonology, syntax, mood constructions and idiom as occur in the texts prescribed for reading and translation.

### B. Latin Composition.

The student should have ample practice in using all of the major constructions of Latin prose that he encounters in his reading. Unity of treatment should be aimed at, and too much attention should not be given to matters which more properly belong to University work.

### C. Latin Authors.

The following three-year cycle is prescribed:

First Year:

Keene: *Selections from Pliny Illustrating Roman Life* (Macmillan).

Terence: (*Scenes from the Andria*).

Second Year:

Livy: *Legends of Ancient Rome*.

Virgil: *Aeneid, Book I*.

Third Year:

Caesar: *Civil War* (Selections).

Wickham: *Selections from the Four Books of Horace's Odes* (Bell and Sons).

### D. Sight Translation.

The primary aim of all the Latin courses is to develop reading power. In this course the student should be able to read, at sight, passages of average difficulty. Weekly exercises should be given from some book of graded selections, such as—

Duffield: *Exercises in Unseen Translation* (Macmillan).

*Tutorial Latin Reader* (University Tutorial Press).

Maidment and Mills: *Advanced Latin Unseens* (University Tutorial Press).

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## LATIN (Special One-Year Course)

This is a one-year course, and is provided for those students who, not having taken Latin the first two years of their High School course, wish to perfect their mastery of the English language by acquiring the rudiments of Latin. Etymology, word-formation, and the use of Latin words and phrases current in English are to be stressed in this course.

1. An elementary knowledge of the forms of nouns, pronouns, verbs and adjectives, but reduced to a bare minimum. The use of these forms, rather than mere memorization of them, is the important thing.

2. Latin in every-day use:

(a) Phrases, mottoes, etc., used in business and in legal, scientific, literary and social English.

Use and meaning of common abbreviations of Latin words.

(b) Meaning and translation of 150 common quotations and proverbs.

(c) A fundamental Latin vocabulary of about 200 Latin words.

3. The application of Latin to English:

(a) Vocabulary building—groups and families of English words derived from Latin: text-book p. 275.

- (b) Prefixes, suffixes, and prepositions used in building Latin words.
  - (c) The reading of short and easy passages from the reading-book for Latin I. Extent: about 1,000 words.
  - (d) A comparison of the main features of Latin grammar and English grammar; the difference between an *inflected* and an *uninflected* language.
  - (e) Latin as the basis of scientific nomenclature.
4. The history in outline of the Latin language and its literature:
- (a) Early Latin, Classical Latin, Silver Latin, Late Latin, Mediaeval Latin; Church Latin, and Vulgate; Milton's Latin poetry; Scientific Latin; Latin as a world language, and the language of diplomacy.
  - (b) The preservation of Latin texts in manuscript; the collation of manuscripts; mediaeval copyists and illuminators; Humanism and the Renaissance.
  - (c) The relation of Latin to Modern Romance languages.
  - (d) The influence of Latin on English.
    1. Latin of the First, Second, Third, and Fourth Periods; the percentage composition of the present-day English vocabulary.
    2. The Ciceronianism of Elizabethan and of Stuart times.
    3. The influence of Latin literature on English literature. Why classical literature, and not Anglo-Saxon, may be regarded as the true ancestor of English literature.

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## GREEK 1, 2 and 3

- Greek 1.** Benner and Smyth: *Beginner's Greek Book* (American Book Co.) Chapters I-LX (inclusive).  
Colson: *Greek Reader* (Macmillan Co.) Part I, Shorter Stories and Fables, I-XX (inclusive).
- Greek 2.** Benner and Smyth: *Beginner's Greek Book*, Chapters LVI-LX.  
Pitman: *Greek Prose Composition* (Macmillan Co.) Exercises I-XXV.  
Colson: *Greek Reader*, pages 33-41 and 46-67 and 108-116 (inclusive).
- Greek 3.** G. S. Farnell: *Tales from Herodotus* (Macmillan Co.) Selections I-IX and XVI.  
Homer: *Iliad VI*, Leaf and Bayfield (Macmillan Co.).  
Pitman: *Greek Prose Composition*. Exercises XXV-XLIV (inclusive).

## Reference Books and Class-room Equipment

- Kelsey: *Latin and Greek in American Education*.  
 Ashmore: *The Classics and Modern Training*.  
 Babbitt: *Literature and the American College*.  
 Harrington: *Live Issues in Classical Study*.  
 Bennett and Bristol: *The Teaching of Latin and Greek*.  
 Game: *Teaching High School Latin*.  
 Sandys: *Companion to Latin Studies*.  
 Gow: *Companion to the School Classics* (Macmillan).  
 Moulton: *Ancient Classical Drama*.  
 Moulton: *World Literature*.  
 Osgood: *Classical Mythology in Milton*.  
 Root: *Classical Mythology in Shakespeare*.  
 Gayley: *Classical Myths in English Literature*.  
 Mustard: *Classical Echoes in Tennyson*.  
 Byrne: *Syntax of High School Latin*.  
 Lodge: *High School Latin Vocabulary*.  
 Calvin S. Brown: *Latin Songs, with Music*.  
 Duffield: *Latin Hymn Writers and Their Hymns*.  
 F. A. March: *Latin Hymns*.  
 (See also catalogue of Victor gramophone records.)  
 Savin: *Relation of Latin to Practical Life*.  
 Petrie: *Handbook of Roman Antiquities* (Oxford University Press).  
 Johnston: *Latin Manuscripts*.  
*Easy Latin Plays* (Bell and Sons).  
 Susan Paxson: *Two Latin Plays* (Ginn).  
 Schleicher: *Latin Plays* (Ginn).  
 L. O. Lennart: *Classical Stories Dramatized*.  
 F. J. Miller: *Two Dramatizations from Vergil* (University of Chicago Press).  
 Susan Paxson: *A Handbook for Latin Clubs* (Heath).  
*The Classical Journal* (University of Chicago Press).  
*The Classical Weekly* (Columbia University Press).  
 D. M. Robinson, Editor: *Art and Archaeology* (Archaeological Institute of America, Washington, D.C.)  
 Articles in *The National Geographic Magazine*.  
 Platner: *Ancient Rome*.  
 Charts: { *Kampen's Classical Series*.  
           { *Kiepert's Classical Series*.  
 Schreiber: *Atlas of Classical Antiquities*.  
 Kiepert: *Classical Atlas*.  
 Lemis: *Latin Dictionary*.  
 Harper: *Latin Dictionary*.  
 Harper: *Classical Dictionary*.  
 Mau (tr. by Kelsey): *Pompeii*.  
 Lanciani: *Ancient Rome*.

Tarbell: *Greek Sculpture*.

Von Mach: *Greek and Roman Sculpture Prints*, with Handbook.

Fowler: *Roman Literature*.

Fowler: *Social Life in Rome*.

Wall Pictures:

The Perry Pictures, Boston.

The Cosmos Pictures, 119 W. 25th St., New York.

British Museum Postcards (Catalogue may be had from the Curator, Soule Art Publishing Co., Boston).

Sculptures:

See Catalogue of Caproni Casts, P. P. Caproni and Brother, Boston.

The Boston Sculpture Co., Boston.

Lantern Slides:

From F. C. Eastman, University of Iowa.

From C. U. Clark, Director of American Academy in Rome.

McIntosh Stereopticon Co., Chicago.

Coins:

May be had of S. H. Chapman, Drexel Bldg., Philadelphia.

See *Chats on Old Coins*.

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## MODERNS

### Introduction.

The systematic introduction of Modern Languages into secondary school curricula has been of comparatively recent date, but in all systems these languages are rapidly receiving the recognition due them. Their value is unquestionable. From the practical point of view, they are of tremendous importance in business and in public service. In answer to the enquiries sent out by the Committee appointed to report on the position of Modern Languages in the educational system of Great Britain, the majority of business houses acknowledged frankly that business had been hampered by British ignorance of foreign languages.

The war has demonstrated the interdependence of nations, and the need for a more intimate acquaintance, in this country, with the history, policies, and ideals of the leading European peoples. A knowledge of the language of a country makes possible a much more complete and more accurate interpretation of the political, social, industrial and scientific developments in that land. The extensive use of French and German in this country gives further evidence of the value of these languages from the point of view of our own national unity. For a more limited group, a mastery of languages is a pre-requisite to historical and scientific research.

The intellectual values of the study of Modern Languages are those claimed as true for the Classics.

For the past three years we have been using a modified form of the direct method of teaching French in the larger schools of Alberta. Although this method has certain theoretical advantages, the results produced have been on the whole disappointing. This



may be traced to four or five factors, none of which are entirely under the control of educational authorities—

1. For efficient use of the direct methods, the class should not exceed twenty pupils, but economic conditions have thus far made this ideal unattainable.

2. Fluency in speaking French or German can be acquired only by constant oral practice in the language, and by living in an environment which supplements the school-room training. For the great majority of our pupils, such an atmosphere is entirely lacking. Even though an enthusiastic teacher might secure fairly adequate results with a pupil during his High School course, the lack of opportunity for continued use soon results in a loss of the ability to converse intelligently in the foreign tongue in question. This is not equally true of the ability to read the language, inasmuch as there is frequent occasion to use this knowledge.

3. The direct method requires a fully trained language specialist. Thus far there is not an adequate supply of such teachers available.

4. To obtain satisfactory results with this method there should be daily lessons of at least an hour's duration. It is not practicable to make a sufficient allowance of time in the High School course to provide for this.

5. The values of conversational training are limited and contingent. Only a small portion of the High School pupils will find occasion to use an oral vocabulary, or be able to proceed further in its acquisition. The general course here, as elsewhere, must be arranged to meet the needs of the great majority of the class.

In view of these facts, it has been deemed unwise to continue the oral examination in French. It is expected that the teacher will continue to give a part of his instruction in the foreign tongue, and give pupils some practice in oral expression. Teachers should encourage their pupils to learn short memory gems, and to carry on short dialogues in the foreign tongue. More stress will be laid in the future, however, on the linguistic and literary factors, with a view to training the pupils to read and write fluently.

In the new curriculum, a two-unit course is being offered in the first three years of the High School programme and, in addition, a one-unit course is to be offered in the fourth year.

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## FRENCH 1

### Text.

Fraser and Squair: *New French Grammar*, Part I, Lessons 1-22 inclusive.

### Grammar.

Full conjugation of the three regular verbs, also of *avoir* and *être*, together with the following irregular verbs: *vouloir*, *pouvoir*, *voir*, *faire*, *dire*, *mettre*, *écrire*, *prendre*, *venir*, *aller*, *lire*, *savoir*, omitting in each case the *present* and *imperfect subjunctive* and the *conditional*.

## Reading.

Cran: *Graduated French Reader*.

Part I—Exercises 1-25.

## Sight Reading Not Required.

Special attention should be given to securing correct pronunciation and accent. Throughout the course in all grades as much work in dictation and conversation should be given as time will permit. The early part of the grammar should be introduced through oral work as far as possible. Every teacher should adopt some definite and systematic plan for the teaching of pronunciation which may or may not be based on phonetics; but in view of the plan of the prescribed text-book in grammar, it is recommended that the phonetic system be adopted wherever possible.

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## FRENCH 2

### Grammar.

Text: Fraser and Squair's *New French Grammar*, Part I, Lessons 22-38 inclusive.

The following irregular verbs: *Aller, envoyer, acquérir, courir, cueillir, dormir, haïr, mourir, ouvrir, tenir, venir, battre, boire, conclure, conduire, connaître, craindre, croire, dire, écrire, faire, lire, mettre, naître, plaire, prendre, rire, suivre, vaincre, vendre, vivre, recevoir, devoir, asseoir, falloir, pleuvoir, savoir, valoir, voir, vouloir*.

"*Anecdotes*" (pp. 190-208) may be omitted, or used by the teacher as illustrative material.

Reading—One book from the following cycle:

Labiche: *Le Voyage de M. Perrichon*.

Labiche: *La Poudre aux Yeux*.

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## FRENCH 3

### Grammar.

Fraser and Squair: *New French Grammar*, Part II, omitting (1) sections on the pronoun (359-407), and substituting therefor a thorough review of the pronoun as given in Part I of the text: (2) sections 169, 171, 182, 183, 187, 196, 205, 207, 216, 217 and 419. Special emphasis on continuous prose and free composition.

Sections on the preposition, conjunction, and interjection are to be used for reference.

### Authors.

One book from the following three-year cycle:

Eckmann-Chatrian: *Madame Thérèse*.

Gréville: *Dosia*.

Eckmann-Chatrian: *Le Conscriit*.

Sight Translation.

## GERMAN 1

### Grammar.

Text—Fraser and Van Der Smissen: *High School German Grammar*, Lessons 1-28.

### Reading.

Super: *Elementary German Reader*, first 20 anecdotes.

Accurate pronunciation should be insisted on from the beginning; the teacher should be especially careful to have the pupils distinguish between the long and short *umlaut* vowels, the guttural and the palatal *ch*, and in the written work, *sz* and *ss*. (It is recommended that the character *sz* should be written: long *s* short *s*, to distinguish it from the double short *s*. This combination, formerly in use in English, is taught regularly in the schools of Germany as the correct way to transcribe *sz* when German script is not used.)

Occasional practice in German script should be given. See Introduction to Grammar, pp. xxiii-xxv.

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## GERMAN 2

### Grammar.

\*Ball: *A German Grammar*. A thorough review of previous year's work; and lessons XXXI to the end.

Special attention should be given to the seven classes of strong verbs, the five classes of nouns, the determinatives, and the strong, weak and mixed declensions of adjectives.

For effective work in easy continuous prose, it is recommended that the students be required to have a dictionary.

### Authors.

One book from the following three-year cycle:

Ernst: *Flachmann als Erzieher*.

Baumbach: *Der Schweigersonn*.

Baumbach: *Waldnovellen*.

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## GERMAN 3

### Grammar.

Fraser and Van Der Smissen: *High School German Grammar*.

### Prose.

Pope: *German Composition*, to end of Part I (p. 55.).

A regular assignment of prose should be given from the very beginning of the first term. Proficiency can be attained only by constant practice. Each student should have a German dictionary of his own.

### Authors.

Ebner Eschenbach: *Die Freiherren von Gemperlein*.

\*Beginning with September, 1930, the Grammar by Fraser and Van Der Smissen will be used in German 2 also.

# HISTORY, CIVICS, AND ECONOMICS

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## General Introductory Note.

In the teaching and study of History, Civics, and Economics in High Schools two aims should be held in view. These can perhaps best be termed the informational and the developmental. These subjects, properly taught and studied, should place the student in possession of a body of knowledge of both practical and cultural value. They should also help, along with other subjects, to develop his intellect, expand his imagination, and engender worthy personal and social ideals.

We live in a complex society. The study of Civics should give to the youthful members of it a knowledge and understanding of its political and social institutions and their operation. The study of Economics, likewise, should give them a knowledge and understanding of the laws governing the production, distribution, and consumption of wealth, in which processes all are interested since they are fundamental to civilized life. But one cannot go far with the study of either Civics or Economics without realizing that they deal with institutions and conditions which are the product of the past, and which are not intelligible without a knowledge of the past. This the study of History should give. The story of man, the unremitting labor, the exhaustless patience, the marvellous ingenuity, the searching thought, the growing spirit of co-operation and self-sacrifice, which have achieved the things of civilization and make them precious—this story is the birthright of every boy and girl. It is this record of the racial past which alone can afford to each successive generation a full understanding of the political, social, and economic environment in which it finds itself. And it is such a knowledge of the past leading to an understanding of the present which is one of the surest safeguards for a sane and enduring progress in the future.

History, Civics, and Economics afford excellent opportunities for intellectual training. They should be so taught as to develop the innate memory capacities of the pupil, and to lead him to organize and group his memory facts in such a way that recall is ready, accurate, and complete. But these subjects are sciences, and the tasks required of the pupil in History should be those required in any other science. He should search for data, group them, and build generalizations thereon. He should be required to discriminate between more and less important facts, should be guided to detect and trace the operation of cause and effect in social development, and should be led to make judgments on historical events and personages, and acquire training in the evalu-



ation of human actions. Care should be taken, from the first, that the pupil should form a scientific method of study. He should be practised in the logical arrangement and effective oral and written presentation of materials. Above all, he should be taught that, as far as it is possible, he should discard preconceptions and prejudices, when he approaches any social problem, and should go whither the facts, in the light of reason, lead him.

But History, Civics, and Economics have a human interest, and possess moral and emotional factors which make them possible agencies for much more than merely intellectual training. This is particularly true of History. Its pages unroll a grand and dramatic human story which should be capable of stirring the imagination, appealing to the sympathies, and arousing generous enthusiasm in boys and girls. They acquaint the student not only with the greatest men of past time, but also with great and vital principles of political liberty and social justice and show the lengths to which human heroism and constructive genius and co-operative effort may go in furtherance of them. In a word, these subjects are capable of placing worthy ideals, both for the individual and for society, before the young, and of affording a stimulus towards their attainment.

In our day, manhood and womanhood suffrage have placed ultimate political authority irrevocably in the hands of the masses of the people. It follows that the problems, political, social, and economic which society faces can be solved only by citizens who possess a knowledge of present-day institutions and conditions, and an understanding of how they came into being; whose minds are trained to clear and honest thinking, and whose thoughts and activities are directed by worthy characters to unselfish social ends. To the training of boys and girls to become such citizens, the subjects of History, Civics, and Economics in the schools are capable of being made a powerful contributory factor.

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## HISTORY 1

### Ancient and Mediaeval History

#### Introduction.

The aim of the course in Ancient and Mediaeval History is to present the career of man as a whole in a connected story of expanding life and civilization, from the days of the rudest stone hatchet to the glorious Renaissance period which ushered in the Modern age.

In dealing with each civilization, while a sufficient frame-work of political organization and historical events requires to be presented, emphasis should be placed rather on the life of man in all its manifestations—society, industry, commerce, religion, art, and literature. These things should be dealt with so as to make clear how one age grows out of another, and how each civilization profits by that which has preceded it. Special attention should be given to those factors of history which the student can articulate with the life of today, or which are essential to an understanding of the



evolution of important conditions now existing. For example, the following, among other things, should be stressed: the contribution to civilization of the Oriental peoples; the cultural achievements of Periclean Athens; the progress in the science of law and government made by Republican and Imperial Rome; the set-back given to civilization by the Barbarian Invasions; the service of the Church in restraining the Barbarians, and preserving and handing on many of the elements of civilized life; the universal ideal for which both Papacy and Holy Roman Empire stood, and the memorable struggle between the two; the origin and character of the Feudal System; the crusading movement and its effects on Europe; particularly the decline of Feudalism, and the development of town life and the middle class; the beginnings of nationalism and the growth in Western Europe of Nation-States and New Monarchies; the scientific and artistic development of the age of the Renaissance. Considerable stress, also, should be laid on the history of England to the close of the Middle Ages, as a necessary foundation for the British History of the modern period in the second year. Attention should be drawn to important phases of the national development, such as the evolution of a royal and national administrative and judicial system; the growth of a Common Law; Magna Charta; the formation of Parliament and the growth of its powers; economic changes in the later Middle Ages which helped the decline of the old nobility; the emancipation of the serf, and the rise of the middle class; the collapse of parliamentary government under the Lancastrians and the growth of a strong New Monarchy as we find it under Henry VII, the first of the Tudors. To study the past in this way should assist the student to understand the present, and as a citizen to build intelligently for the future.

While it is desirable that the period should be dealt with as a series of great interrelated movements, so as to give the student a sense of the unity of history, this should not forbid the inclusion of absorbing stories of universal human interest, such as the romance of modern archaeological research into Oriental antiquities, the story of the great struggle between Rome and Carthage for supremacy in the Mediterranean world, and the careers of men like Philip of Macedon, Alexander the Great, Socrates, Archimedes, Julius Caesar, Augustus, Gregory the Great, Charlemagne, Roger Bacon, and others. It is this narrative element of history which in part fires the imagination of the young High School student, and leads him to view history as the story of interesting people doing intensely interesting things.

### Bibliography for History 1

- \*Van Loon: *The Story of Mankind* (Harrap).
- Wells: *Outline of History*, Vol. I (Macmillan).
- Marvin: *The Living Past* (Clarendon Press).
- Cunningham: *Western Civilization in its Economic Aspects*, 2 vols. (Cambridge University Press.)
- \*Breasted: *Ancient Times* (Ginn and Co.).
- Clodd: *The Story of Primitive Man* (Appleton).
- Baikie: *The Sea-Kings of Crete* (Macmillan).
- The History of Herodotus*, translated by Rawlinson, in "Everyman's Library," 2 vols. (Dent.)

- Bury: *History of Greece* (Macmillan).
- \*Tucker: *Life in Ancient Athens* (Macmillan).
- Lowes Dickinson: *The Greek View of Life* (Methuen).
- Livingstone: *The Greek Genius* (Oxford University Press).
- Mahaffy: *Alexander's Empire* (Putnam).
- \*Zimmerman: *The Greek Commonwealth* (Clarendon Press).
- W. H. Weston: *Plutarch's Lives, retold for Boys and Girls*, illustrated (T. C. and E. C. Jack).
- Botsford: *History of Rome* (Macmillan).
- Bury: *Student's Roman Empire* (American Book Co.).
- \*Tucker: *Life in the Roman World* (Macmillan).
- Dill: *Roman Society*, 2 vols. ("The Last Century of the Western Empire" and "From Nero to Marcus Aurelius") (Macmillan).
- Gibbon: *Decline and Fall of the Roman Empire*, 7 vols., in "The World's Classic Series" (Oxford University Press) or two parts—Greenridge and Anderson, "Students' Dramatic Series" (Murray).
- Emerton: *Introduction to the Study of the Middle Ages* (Ginn & Co.).
- Emerton: *Mediaeval Europe* (Ginn & Co.).
- Emerton: *The Beginnings of Modern Europe* (Ginn & Co.).
- Thorndike: *The History of Mediaeval Europe* (Houghton Mifflin).
- \*Fletcher: *An Introductory History of England to 1485* (John Murray).
- Einhard: *Charlemagne* (American Book Co.).
- Brown: *The Venetian Republic* (Macmillan).
- Lanier: *The Boys' Froissart* (Scribners).
- Adams: *Civilization During the Middle Ages* (Scribners).
- \*Davis: *Readings in Ancient History*, 2 vols. ("Greece and the East" and "Rome and the West") (Allyn and Bacon).
- \*Botsford: *Source Book of Ancient History* (Macmillan).
- \*Botsford: *Readings in European History*, Vol. I (Ginn & Co.).
- Thatcher and McNeal: *Source Book for Mediaeval History* (Scribners).
- \*Ramsay: *Philip's New Historical Atlas for Students* (George Philip & Son, London).

■ The asterisk (\*) indicates books which it is thought will be of special value in the study of the course.

## HISTORY 2

### British History from 1485 to the Present Day.

British History of the Modern age is placed in the second year to provide the necessary setting for the study of Canadian History and Civics in the third year. Our laws and institutions are for the most part fundamentally British in their origin and genius and therefore the proper foundation to their study is a knowledge of the history of the Mother Land.

In teaching this period, main movements should be kept steadily before the pupils' attention and particular facts given significance by being related to outstanding tendencies of development. There is, for instance, the theme of English exploration and

expanding overseas trade and naval power under the Tudors, or there is that of the enclosure movement with its accompanying problem of vagabondage and its remedy of poor law legislation. There is the topic of religious change—of the Protestant Reformation and the Catholic Counter-Reformation, of the struggle of Puritans and Sectaries with Anglicans, of later Nonconformity, and of the slow growth of religious toleration—a theme which carries the student through the Sixteenth and Seventeenth centuries and on into the Eighteenth and Nineteenth. The growing friendly relations between England and Scotland resulting in ultimate Parliamentary union is another development about which may be gathered many details of two centuries of history. The relation between England and Ireland and the growth of a great English literature are themes which extend through the entire period. So, too, does the topic of England's foreign policy with its central thread of a support of the principle of the balance of power. The student should be shown how, on the whole, this policy has been consistently followed, leading England in the time of Philip II, of Louis XIV, of Napoleon, and of William II to become the champion and preserver of European liberties against threatening despotism. Above all, however, three main developments of British history should be stressed, since through them Britain has most profoundly affected the rest of the world. First, there is the growth of the British Empire or Commonwealth of Nations, of which Canada is a member, and which, based on the principles of law and liberty, is so great an actual and potential force in the modern world. Secondly, there is the development of the Industrial Revolution in Britain which from thence spread to other lands and has transformed the world's material civilization, bringing many of our modern problems in its train. Thirdly, there is the story of the growth of British political liberty, how in England, first of all countries, Parliament grew up and won supremacy within the state, how the Cabinet system was evolved as its executive instrument, how political parties grew up, how the franchise was given to the masses of the people in successive reform bills, and how finally this democratic, parliamentary and cabinet system of government has been copied, with various modifications, by most self-governing states throughout the world.

In treating these and other topics, the details of battles and wars should be much less stressed than the principles and issue which were at stake in them. Students should be taught to take a just pride in their citizenship in the British Commonwealth, but such pride should be founded not on mere victories over other states or people. It should even not be based on the vast size, wealth and power of the Commonwealth, though these are legitimate subjects for pride. It should be founded rather on the fact that, on the whole, the British people have stood throughout their long history for freedom and justice in the world and that they have made great and enduring contributions to its civilization.

### **Bibliography for History 2**

\*Ramsay Muir: *Philip's New Historical Atlas for Schools* (Philip & Son).



- \*Ramsay Muir: *Short History of the British Commonwealth*, 2 vols. (Philip & Son).
- Innes: *History of England and the British Empire*, Vols. II, III, and IV (Rivington).
- The Political History of England*, Vols. V to XII (Longmans).
- Vol. V, 1485-1547, by H. A. L. Fisher.
- Vol. VI, 1547-1603, by A. F. Pollard.
- Vol. VII, 1603-1660, by F. C. Montague.
- Vol. VIII, 1660-1702, by Richard Lodge.
- Vol. IX, 1702-1760, by I. S. Leadam.
- Vol. X, 1760-1801, by Wm. Hunt.
- Vol. XI, 1801-1837, by G. C. Brodrick and J. K. Fotheringham.
- Vol. XII, 1837-1901, by Sidney Low.
- A History of England*, Vols. IV to VII (Methuen).
- Vol. IV, *England under the Tudors*, by A. D. Innes.
- \*Vol. V, *England under the Stuarts*, by G. M. Trevelyan.
- Vol. VI, *England under the Hanoverians*, by C. Grant Robertson.
- Vol. VII, *England since Waterloo*, by J. A. R. Marriott.
- \*Green: *Short History of the English People* (Macmillan).
- Keatinge and Frazer: *History of England for Schools* (Black).
- \*Trevelyan: *A History of England* (Longmans).
- Trevelyan: *British History in the Nineteenth Century* (Longmans).
- \*Hayes: *Brief History of the Great War* (Macmillan).
- The "English Men of Action" Series* (Macmillan).
- Volumes on Sir Colin Campbell, Clive, Captain Cook, Dampier, Drake, General Gordon, Warren Hastings, Havelock, Lawrence, Livingstone, Monk, Montrose, Napier, Nelson, Rodney, Strafford, Wellington, Wolfe.
- The "Twelve English Statesmen Series"* (Macmillan).
- Volumes on Chatham, by Frederic Harrison; Elizabeth, by Beesley; \*Henry VII, by Gardiner; Peel, by Thurstfield; Pitt, by Lord Rosebery; Walpole, by John Morley; William III, by Traill; Wolsey, by Creighton.
- Seeböhm: *The Oxford Reformers* (Longmans).
- Rennell Rodd: *Sir Walter Raleigh* (Macmillan).
- \*Firth: *Oliver Cromwell* (Putnam).
- \*Morley: *Life of Gladstone* (Macmillan).
- \*Morley: *Edmund Burke* (Macmillan).
- Masterman: *History of the British Constitution* (Macmillan).
- \*Adams: *Constitutional History of England* (Henry Holt).
- Pollard: *Evolution of Parliament* (Longmans).
- Lucas: *The British People* (Macmillan).
- \*Seeley: *The Expansion of England* (Macmillan).
- \*Tickner: *Social and Industrial History of England*.
- Townshend Warner: *Tillage, Trade, and Invention* (Blackie).
- \*Townshend Warner: *Landmarks in English Industrial History* (Blackie).
- Cheyney: *Industrial and Social History of England* (Ginn).
- \*Traill: *Social England*, 6 vols. (Putnam).
- \**English History from Original Sources*, 9 vols. (Inexpensive) (Black).
- \*Cheyney: *Readings in English History* (Ginn).

\**Picture Books of British History* (Cambridge Univ. Press).

Froude: *History of England from the Fall of Wolsey to the Defeat of the Spanish Armada*, 12 vols. (Longmans).

Gardiner: *History of England, 1603-1642*, 10 vols. (Longmans)

Gardiner: *History of the Great Civil War, 1642-1649*, 4 vols. (Longmans.)

Gardiner: *History of the Commonwealth and Protectorate, 1649-1656* (Longmans).

Firth: *The Last Years of the Protectorate, 1656-1658*, 2 vols. (Longmans).

Lecky: *History of England in the Eighteenth Century*, 7 vols. (Longmans).

Paul: *History of Modern England*, 5 vols. (Macmillan.)

Walpole: *History of England from the Conclusion of the Great War in 1815* (Longmans).

■ The asterisk (\*) indicates books which it is thought will be of special value in the course.

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## HISTORY 3

### Canadian History, Canadian Civics, and Elementary Economics

#### A. Canadian History.

This course entails a study of the British period with a review of the salient features of the French period.

The course in Canadian History and Civics has been placed late in the syllabus because it was felt desirable that any additional discussion of the problems of Canadian political and social development should aim to deal frankly, honestly and fearlessly with certain very specific problems of fundamental significance to our people.

It is recognized that Canadian history and current Canadian politics, fortunately or unfortunately, bristle with controversial problems, and it is hoped that the study of a stimulating period of world history and of the modern period of British history will enable the student to approach Canadian history with the background of knowledge, the breadth of view, the fairness of judgment and the qualities of imagination necessary to its effective study. The teacher should spare no pains to bring the student to a view of *both* sides of past controversies, so that the bases may be laid for that mutual understanding and respect which alone can smooth the path of our future national and international developments. Thus, in treating the struggle between the English and the French for North America or between Britain, Canada, and the United States in 1812, the most scrupulous fairness should be shown, for on both sides in each case much can be said of praise as well as of blame, and to see the justification on both sides clearly works for the removal of prejudice and bitterness. Similarly, in treating internal affairs, the scales should be held evenly between creed and creed, between party and party, and between race and race. In dealing with the evolution of Responsible Government, students should not be left with the impression (which much teaching and many texts have in the past conveyed) that at the time all Canadians were for Responsible Government and were wholly right and



that all British statesmen were stupidly and stubbornly opposed to it and wholly wrong. On the contrary, students should be shown that both Canadians and Englishmen were divided on the question, that great British statesmen like Durham, Sydenham, Elgin and Grey, were laboring as efficiently as Canadians to evolve a working system of Responsible Government, and that however clear it may be to us in the light of after events that Responsible Government was wise, yet in fairness it must be admitted that one hundred years ago when circumstances and ideas were different, many were able to oppose it with arguments which then were not unreasonable. So, too, the race problem in Canada. Our history should be so taught as to give English-speaking Canadians a clear and sympathetic understanding of French-Canadians, and *vice versa*. On such a mutual understanding, and on the tolerance and co-operation which spring from it, depend the unity and prosperity of our common country.

In general the treatment of topics will follow the sequence indicated in the table of contents of the prescribed text. The introductory discussions should bring out, in particular, the following facts:

- (a) The organization of Canada under French rule, particularly Royal Government; the seignorial system, the important part played by the Church in the life of the colony; the economic life of New France. These topics should be so taught as to bring out clearly the main elements of strength and weakness in the French regime.
- (b) A similar sketch of the English colonies in America, comparing their organizations with that of New France.
- (c) An analysis of the causes of the fall of French power in North America.

This period down to 1763 should be covered rapidly, in from eight to ten periods.

## **B. Canadian Civics.**

For Canada, a member of the British Commonwealth, the study of Civics falls naturally into four main divisions, namely: Imperial, Federal, Provincial, and Municipal or Local. Since the power of self-government originated with the first unit and was gradually granted to the others, the above sequence is a logical order of treatment. In developing the subject, it is necessary to see that the student obtains a thorough grasp of the composition and powers of each of these great sections of government, noting the authority and limitations of each. The student must be given a clear conception, also, of the further division of authority within each unit into legislative, executive, and judicial powers. The significance of whatsoever part of actual government comes within the range of the student's personal experience should be clearly explained and emphasized. It will naturally lead to a broader conception of the whole working of government if the teaching is supplemented by a habit of reading about current events from day to day. Thus the trend of economic developments will be closely

related with that of political tendencies, as the one is of necessity intimately connected with the other. An effort should be made not simply to teach the bare facts of government but also to observe and study in a concrete way the working out of the system as applied to every-day life in the local community, province, Dominion, or Empire. It should be borne in mind that the study of Civics is not merely to gain a knowledge of facts, but to equip the student with a clear comprehension of the application of government, so that he will be encouraged and stimulated to take an intelligent part in civic affairs.

## I. The Imperial Government.

It should be stressed at the beginning that present-day Britain is a democratic state with sovereign political power now vested in the people by virtue of successive extensions of the franchise in 1832, 1867, 1884, and 1918. This political sovereignty of the people is exercised through a Parliament composed of King, Lords, and Commons, which is the legal sovereign, and which directly wields the legislative power and indirectly controls the executive and judicial powers.

### A. THE LEGISLATIVE POWER.

1. *The King*: Necessity of the royal assent to Bills in order to make them Acts; the disuse of the royal veto. (Masterman, p. 164.)
2. *The House of Lords*:
  - (a) Brief historical outline from its beginnings in the Anglo-Saxon Witan to the present day (Bourinot, p. 60; Marriott, pp. 136-167).
  - (b) The functions and limitations of the House of Lords at the present day, with special reference to changes in status which took place in 1832 and 1911 (Masterman, p. 214; Marriott, pp. 157-167; Bagehot, p. 99).
3. *The House of Commons*:
  - (a) A historical sketch of the development of the representative principle in England.
  - (b) The evolution of the bicameral system.
  - (c) The growing control of the Commons over taxation and legislation.
  - (d) The democratization of the Commons through the expansion of the franchise into manhood and womanhood suffrage. (Bourinot, pp. 63, 64; Marriott, pp. 168-230.)

### B. THE EXECUTIVE POWER.

1. *The Formal Executive*:  
The Crown.

- (a) Historical outline of the development of the Monarchy:
  - (1) The Monarchy before 1688.
  - (2) The effects of the Revolution on the Monarchy.
  - (3) The decline of the power of the Monarchy under the Hanoverians.
- (b) The meaning of the phrase: "The King can do no wrong."
- (c) The non-political functions of the monarch. (Bourinot, pp. 51-54 and 57-58; Marriott, pp. 43-68.)

## 2. *The Political Executive:*

The Cabinet, the Prime Minister, and the Crown.

- (a) Historical sketch of the origin and development of the Cabinet.
- (b) The principle of Cabinet government.
  - (1) The exclusion of the monarch.
  - (2) Harmony between executive and legislature.
  - (3) Unity.
  - (4) Collective responsibility.
  - (5) The subordination of the Cabinet to the Prime Minister.
- (c) The Prime Minister.
  - (1) The evolution of the office.
  - (2) The position of a modern Prime Minister.
- (d) The political power of the Crown.
  - (1) How far has it suffered eclipse?
  - (2) The Crown and Imperial Unity. (Bourinot, pp. 54-57; Marriott, pp. 68-100; Masterman, pp. 227-231.)

## 3. *The Permanent Executive:*

The Civil Service. (Masterman, pp. 232-233; or for fuller information than it is necessary to give to classes, Marriott, pp. 101-126.)

## C. THE JUDICIAL POWER.

- 1. Origin of the Courts of Justice. (Masterman, pp. 30-44.)
- 2. The Judicial Committee of the Privy Council. (Bourinot, p. 69; Marriott, p. 300.)

## D. IMPERIAL RELATIONS WITH CANADA.

- 1. The British Parliament legally sovereign throughout the British Empire, but not so in actual practice. Canadian rights of self-government. (Masterman, p. 252.)
- 2. The Governor-General as representative of the King and the Imperial Government.
- 3. The Secretary of State for the Colonies.
- 4. The Judicial Committee of the Privy Council.

5. The power of reserving bills and disallowing acts.
6. The making of treaties.
7. Imperial Conferences; their possibilities.

(References: McCaig, p. 197; Masterman, pp. 237-257.)

Students should be given to understand that the whole question of the relationship between the Imperial Government and the Dominion is in a state of flux and development, and that the Dominions as a result of the Great War have obtained a status in the Commonwealth much more like that of equal partnership with the Motherland than pre-war books would indicate.

## II. The Dominion Government.

Attention should first be called to the fact that the Canadian Constitution is a federal one, and in this respect quite different from the unitary British Constitution treated above. The distinction between the federal and unitary principles should be made quite clear.

### A. THE LEGISLATIVE POWER.

1. *The King*, represented in Canada by the Governor-General; royal assent to bills; the power of reservation. (B. N. A. Act, secs. 55-57.)
2. *The Senate*.
  - (a) The qualifications of members and the method of appointment.
  - (b) The disability of the Senate with respect to money bills. (B. N. A. Act, secs. 21-36.)
3. *The House of Commons*.
  - (a) The number and distribution of members. (Bourinot, pp. 102-103.)
  - (b) How elections are held; the franchise; the political parties and their organization; the campaign; the official conduct of voting. (Grant, Chap. XXXIV.)
4. *How Parliament does business*: The Speaker and other officers of the House; the Speech from the Throne; motions, debates, and division of the House; petitions; the previous question; bills; money questions; the budget, and the annual supply or appropriation bill; committees; the closure (Grant, p. 426, Ch. XXXVII); adjournment, prorogation and dissolution.
5. *The Subjects of Dominion Legislation*. (B. N. A. Act, sec. 91.)

### B. THE EXECUTIVE POWER.

1. *Formal: The King*, represented by the Governor-General. The appointment of the latter and his functions.

2. *Political: The Cabinet and the Premier.*

- (a) The method of their appointment, and conditions under which they can continue to hold office.
- (b) The departments of government and the functions of each.
- (c) The relationship of the Cabinet to the Privy Council of Canada and the meaning of the terms "the Governor-General-in-Council" and "Order-in-Council."
- (d) The Great Seal of Canada, and its use.

3. *Permanent: The Civil Service.* The method of appointment and the important part the civil service plays in government.

C. THE JUDICIAL POWER.

Function, appointment, payment, and tenure of office of the judges, the Supreme Court of Canada; the Exchequer Court of Canada; the Admiralty Court of Canada. (Bourinot, pp. 133-138.)

D. THE REVENUE AND EXPENDITURE OF THE DOMINION.

Sources of revenue; the main objects of expenditure; the consolidated fund of Canada; the national debt; banks; money and coinage. (*Canada Year Book.*)

E. NATIONAL DEFENCE. (Bourinot, pp. 144-148.)

F. THE INDIANS. (Bourinot, pp. 148-150; McCaig, pp. 160-197.)

### III. Provincial Government: Alberta.

A. THE LEGISLATIVE POWER.

- 1. *The King*, represented by the Lieutenant-Governor. Royal assent to bills; Dominion power of disallowment.
- 2. *The Legislative Assembly.* Methods of holding elections and conducting business in the House much the same as in the case of the Dominion, which see.
- 3. *The subjects of Provincial Legislation.* (B. N. A. Act, secs. 92-95.)
- 4. *The Dominion Power of Disallowance.* (Bourinot, pp. 170-195.)

B. THE EXECUTIVE POWER.

- 1. *Formal*—The King, represented by the Lieutenant-Governor. The appointment and function of the Lieutenant-Governor; his position compared with that of the Governor-General.
- 2. *Political.* The Executive Council.
  - (a) The departments of government, their heads, and their functions.
  - (b) The Provincial Seal.
- 3. *Permanent.* The Civil Service.



C. THE JUDICIAL POWER.

1. The English common law ; statute of law.
2. The constitution and organization of the courts of law, the procedure of trials ; the system of appealing cases. (McCaig, pp. 243-256.)

D. REVENUE AND EXPENDITURE OF THE PROVINCE.

1. Methods of taxation.
2. The provincial subsidy.
3. The provincial debt. (The Annual Report of the Provincial Treasurer.)

E. THE PUBLIC UTILITIES COMMISSION.

Its constitution and duties. (McCaig, pp. 202-227, 268-273.)

**IV. Municipal Government.**

A. THE KINDS OF MUNICIPALITIES.

B. THE ELECTION OF MUNICIPAL COUNCILS ; VOTERS' LISTS, OFFICERS, ELECTION PROCEDURE.

C. HOW MUNICIPAL COUNCILS DO BUSINESS ; MEETINGS, BY-LAWS, BORROWING POWER, POWERS OF TAXATION, COMMISSIONERS, ETC.

D. THE SUBJECTS OF MUNICIPAL CONTROL. (McCaig, pp. 228-242.)

**V. The Educational System of Alberta.**

A. PROVINCIAL POWERS OF CONTROL OVER EDUCATION.

1. *Legislative Control.* (B. N. A. Act, sec. 193.)

- (a) The School Act.
- (b) The School Assessment Act.
- (c) The School Attendance Act.
- (d) The School Grants Act.
- (e) The Educational Tax Act.

2. *Administrative Control* : The curriculum examination ; inspection of schools ; professional training in the Normal Schools, etc.

B. LOCAL CONTROL BY SCHOOL DISTRICTS AND SCHOOL BOARDS.

1. The organization of school districts.
2. The number of trustees and the methods of election.
3. The powers and duties of school boards.

C. THE UNIVERSITY OF ALBERTA.

D. THE PROVINCIAL AGRICULTURAL SCHOOLS.

E. THE PROVINCIAL INSTITUTE OF TECHNOLOGY. (McCaig, pp. 258-267.)

(Reference Texts : See Bibliography.)

## Elementary Economics.

The purpose of Economics is to give pupils "an awareness of what it means to live together in organized economic society, an appreciation of how we do live together, and an understanding of the conditions precedent to living together well" to the end that there may be developed those ideals, abilities, and tendencies to act which are essential to effective participation in modern economic life. The course aims to describe Canadian economic institutions, and to explain the working of our economic organization. Special attention is called to the questions appended to each chapter. These are designed to evoke discussion about Canadian problems, or to elaborate and qualify general principles. It is hoped that they will be of material assistance to the teacher in dealing with the subject.

### Bibliography for History 3

#### Canadian History.

- \*Lucas: *History of New France* (Oxford University Press).
- The Works of Francis Parkman*, 16 vols. (Morang).
- \*Egerton: *Canada Under British Rule* (Oxford University Press).
- \*Kennedy: *The Constitution of Canada* (Milford).
- \*Kennedy: *Documents of the Canadian Constitution* (Oxford University Press).
- Bradley: *The Making of Canada* (Copp, Clark).
- Lucas: *History of Canada, 1763-1812* (Clarendon Press).
- Lucas: *The War of 1812* (Clarendon Press).
- Bradshaw: *Self-Government in Canada* (P. S. King & Son).
- \*Durham: *Report on Canada* (Methuen).
- The Makers of Canada Series* (Morang).
- \**The Chronicles of Canada*, 32 vols. (Glasgow, Brook).
- Canada and Its Provinces*, 23 vols. (Glasgow, Brook).
- \*Morison: *Imperial Supremacy and Canadian Self-Government* (MacLehose).
- \*Pope: *Memoirs of Sir John A. Macdonald*, 2 vols. (Durie, Ottawa).
- \*Willison: *Sir Wilfrid Laurier and the Liberal Party* (Morang).
- Skelton: *Life of Sir Wilfrid Laurier* (Gundy).
- \*Beebles Wilson: *The Great Company* (Copp, Clark).
- \*Siegfried: *The Race Question in Canada* (Nash).

#### Canadian Civics.

- \**The British North America Act and amendments.*
- \*Bourinot: *How Canada is Governed* (Copp, Clark).
- Jenkins: *Canadian Civics* (Copp, Clark).
- \*Marriott: *English Political Institutions* (Oxford University Press).
- Canada and Its Provinces*, Vol. VI—
  - Section on the Federal Constitution, by A. H. F. Lefroy.
  - Section on the Federal Government, by Sir Joseph Pope.
- \*Kennedy: *The Constitution of Canada* (Milford).
- Riddell: *The Constitution of Canada in Its History and Practical Working* (Oxford University Press).
- Sir Robert L. Borden: *Canadian Constitutional Studies* (University of Toronto Press).

Poley: *Federal Systems of the United States and the British Empire* (Pitman).

■ The asterisk (\*) indicates books which it is thought will be of special value in the course.

## ECONOMIC

### Elementary Works:

- C. J. Bullock: *The Elements of Economics*.  
Henry Clay: *Economics for the General Reader*.  
T. N. Carver: *Elementary Economics*.  
Ely and Wicker: *Elementary Principles of Economics*.  
Penson: *The Economics of Everyday Life*.

### Advanced Works:

- Edwin Cannan: *Wealth*.  
H. J. Davenport: *The Economics of Enterprise*.  
Alfred Marshall: *Principles of Economics*.  
\*F. W. Taussig: *Principles of Economics*.

### Special Studies:

- \*L. H. Haney: *Business Organization and Combination*.  
\*H. D. Henderson: *Supply and Demand*.  
Wm. Smart: *The Theory of Value*.  
\*J. A. Todd: *The Mechanism of Exchange*.  
\*C. F. Dunbar: *The Theory and History of Banking*.  
Irving Fisher: *The Purchasing Power of Money*.  
C. L. Raper: *Railway Transportation*.  
\*Kirkaldy and Evans: *The History and Economics of Transport*.  
\*D. A. MacGibbon: *Railway Rates and the Canadian Railway Commission*.  
O. D. Skelton: *The Railway Builders* (Chronicles of Canada series).  
Harold Wright: *Population*.  
T. N. Carver: *The Distribution of Wealth*.  
Irving Fisher: *The Nature of Capital and Income*.  
Irving Fisher: *The Rate of Interest*.  
\*Jeremiah Jenks: *The Trust Problem*.  
\*F. T. Carlton: *History and Problems of Organized Labor*.  
G. S. Watkins: *Introduction to the Study of Labor Problems*.  
C. M. Lloyd: *Trade Unionism*.  
Hugh Dalton: *Principles of Public Finance*.  
M. E. Robinson: *Public Finance*.  
Carl C. Plehn: *Introduction to Public Finance*.  
\*E. R. A. Seligman: *Essays on Taxation*.  
C. F. Bastable: *Theory of International Trade*.  
\*C. F. Bastable: *Commerce of the Nations*.  
Hartley Withers: *Money-changing*.  
\*A. C. Whitaker: *Foreign Exchange*.  
\*O. D. Skelton: *Socialism: A Critical Analysis*.  
Thomas Kirkup: *A History of Socialism*.  
Official Statistics for Canada can be found in the annual volumes of *The Canada Year Book*, issued by the Dominion Bureau of Statistics, Ottawa.

■ The asterisk (\*) indicates books which it is thought will be of special value in the course.

## HISTORY 4

### General History of the Modern Age and English Constitutional History.

#### Introduction.

The course in History for the fourth year is intended to be a continuation of the study of mankind as a whole, begun in the first year. It takes up the narrative at the close of the Middle Ages, and follows the fortunes of the peoples of the Western World through political, religious, economic, social, intellectual, and cultural changes down to the Great War and the present day.

The catastrophe of 1914, with its tragic sequel, has led thinking people to the conclusion that there can never be a common peace in the world without common ideals, and principles based on common knowledge. It is hoped that, in this course, by giving the student an opportunity to examine critically the main facts of the history of all nations for the past five hundred years, education may play its part in raising young Canadian citizens from the ideas of narrow nationalism, or even imperialism, to a higher plane of internationalism, where they will be swayed by no prejudice of race, creed, or tongue.

While this is by all means the most interesting, it is also the most complicated period in the whole recorded history of mankind. An effort should be made to make sure that the pupil understands what he reads, and sees its relation to other things. The memorizing of a mass of unrelated dates should be avoided, though a sufficient number must be mastered to serve as landmarks. The political activities of the people, since they are the most highly developed expression of man's social instincts, should receive due attention. At the same time, as it is generally recognized that the political activities of mankind are largely determined by his economic and social needs and ambitions, emphasis must be placed on movements such as the Commercial and Industrial Revolutions, and the evolution of the powerful middle class, or bourgeoisie, which has done so much to condition progress in the modern world. Likewise, the injustices from which the masses of the people have suffered in the past should be made clear, the growth in organization and power of the proletariat should be traced, and no effort should be spared to build up in the student the habit of taking a broad view and making fair judgments as between class and class, for the prosperity and peace of the world depend as much on mutual understanding and fair dealing between class and class as between nation and nation.

In addition to the General History, a course in the study of the British Constitution is prescribed. This aims at giving the student an appreciation of our political institutions as the result of centuries of development, and a fuller realization of the bearings of governmental organization and practice upon public well-being.

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#### Bibliography for History 4

Emerton: *The Beginnings of Modern Europe* (Ginn and Co.).  
Lord Acton: *Lectures on Modern History* (Macmillan).



Cunningham: *Western Civilization in its Economic Aspects*, Vol. II (Cambridge University Press).

Hayes: *Political and Social History of Modern Europe*, 2 vols. (Macmillan.)

Hayes: *Brief History of the Great War* (Macmillan).

Symonds: *Short History of the Renaissance in Italy* (Holt).

Symon and Bensusan: *The Renaissance and Its Makers* (Dodge).

Emerton: *Erasmus* (Putnam).

Johnson: *Europe in the Sixteenth Century* (Rivington).

Lindsay: *History of the Reformation*, 2 vols. (Scribners).

Baudrillart: *The Catholic Church, the Renaissance, and Protestantism* (Benziger).

Motley: *The Rise of the Dutch Republic* (Crowell).

Wells: *Outline of History*, Vol. II (Macmillan).

Harrison: *William the Silent* (Macmillan).

Wakeman: *The Ascendancy of France, 1598-1715* (Rivington).

Perkins: *Richelieu and the Growth of French Power* (Putnam).

Gardiner: *The Thirty Years' War* (Longmans).

Hassall: *The Balance of Power, 1715-1789* (Rivington).

Johnson: *The Age of the Enlightened "Despots," 1660-1789* (Methuen).

Carlyle: *Frederick the Great*, edited by Hughes (Oxford University Press).

\*Madelin: *The French Revolution* (Putnam).

Rose: *The Life of Napoleon* (Geo. Bell and Son).

Ogg: *The Economic Development of Modern Europe* (Macmillan).

Bourgeois: *History of Modern France, 1815-1913* (Cambridge University Press).

Lichtenberger: *Germany and Its Evolution in Modern Times* (Constable and Co.).

Robertson: *Bismarck* (Constable and Co.).

Marriott: *The Eastern Question* (Oxford University Press).

Wallace: *Russia* (Cassell).

Cesaresco: *Cavour* (Seeley, Service and Co.).

\*Powers: *The Things Men Fight For* (Macmillan).

\*Marvin: *The Unity of Western Civilization* (Oxford University Press).

Marvin: *The Century of Hope* (Clarendon Press).

\*Robinson: *Readings in European History*, Vol. II (Ginn & Co.).

\*Ramsay Muir: *Philip's New Historical Atlas for Students* (Geo. Philip and Son).

Bagehot: *The English Constitution* (Kegan Paul).

Lowell: *The Government of England*, 2 vols. (Macmillan).

\*Masterman: *How England is Governed* (Knopf).

Dicey: *The Law of the Constitution* (Macmillan).

\*Adams: *Constitutional History of England* (Holt).

Maitland: *Constitutional History of England* (Cambridge University Press).

\*Ogg and Beard: *National Governments and the World War* (Macmillan).

■ The asterisk (\*) indicates books which it is thought will be of special value in the course.



# HOUSEHOLD ECONOMICS 1

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Time: Approximately three hours per week—one hour for discussion and two hours for laboratory work.

Length of term, 10 months. Half term, 5 months.

A. First half of term—Foods and Nutrition.

B. Second half of term—Clothing.

## A. Foods and Nutrition

### I. Discussion Periods.

1. Preservation of foods. Keeping qualities. Study of storage systems.
2. Sanitation of food. Milk supply. Foods exposed on markets, etc.
3. Food principles. Caloric value of common foods, visualized in ordinary serving amounts, in order to approximate meal values quickly.
4. Selection of foods for children and adults.
5. Food requirements.
6. Budgets for food.
7. Organization of work.
8. Care of kitchen equipment.

### II. Laboratory Work.

1. Canning Fruit—cold pack and open kettle methods.
2. Canning Vegetables—cold pack method.
3. Pickling.
4. Jelly-making.
5. Breakfast dishes—cereals, quickbreads, eggs, dried fruits, beverages.
6. Planning and preparing breakfasts for a family of adults and children, doing at least part of the marketing.
7. Luncheon or supper dishes—cream soups, salads, scallops, cheese and fish dishes, fresh fruits and cake.
8. Planning and preparing suppers or luncheons for families of adults and children, doing at least part of the marketing

## B. Clothing

### I. Discussion Periods.

1. Study of cotton and linen fibres.
  - (a) Source.
  - (b) Physical characteristics.

- (c) Manufacturing processes—
  - Common weaves, wearing qualities, etc.
  - Methods of dyeing and printing.
  - Finishing processes—weighing, dressing, etc.
  - Adulterations and household tests for detecting the presence of substitute fibres.
- 2. Study of cotton and linen fabrics—names, widths, prices, color tests, quality, etc.
- 3. Costume design—line, color, style.
- 4. Care of clothing.
- 5. Planning of clothing budgets.
- 6. Removal of stains.

### **Home Projects Suggested.**

- 1. Renovating and remodeling of clothes for one's self or other members of the family.
- 2. Washing one's own clothing.
- 3. Care of linen closet. Care of family linen.
- 4. Planning one's wardrobe for the year.
- 5. Selection and making of drapes or curtains for one's room, or making more attractive any other room in the house.
- 6. Laundering of curtains, etc.

### **II. Laboratory Periods.**

- 1. Use and care of sewing machine.
- 2. Use of commercial patterns—selection and alteration.
- 3. Cutting, fitting and finishing garments to include the following:
  - (a) Common seams—French and fell.
  - (b) Common hems—straight, faced, French.
  - (c) Plackets—bound, bound and faced, hemmed.
  - (d) Sewing on lace and embroidery.
  - (e) Putting in sleeves.
  - (f) Making button holes and sewing on buttons.
  - (g) Mending cottons and linens.
  - (h) Applied design.

### **Suggested Problems Using Cottons and Linens.**

- 1. Handling of cotton material—one undergarment.
- 2. Handling of linen material—one household article involving applied design.
- 3. Mending of cotton and linen.
- 4. Child's garment, made over from an adult's garment.
- 5. Cotton dress or middy.

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## **HOUSEHOLD ECONOMICS 2**

Time: Approximately three hours per week—one hour for discussion and two hours for laboratory work.

- A. First half of term—Clothing.
- B. Second half of term—Nutrition.

## **A. Clothing.**

### **I. Discussion Periods.**

1. Choice of materials.
2. Costume design in relation to garments made.
3. Study of silk and wool fibres.
  - (a) Origin. Physical characteristics.
  - (b) Manufacturing processes—
    - Common weaves—wearing qualities.
    - Methods of dyeing and printing.
    - Finishing processes, weighing, dressing, etc.
    - Adulterations, and household tests for detecting the presence of substitute fibres.
4. Study of silk and wool fabrics—names, widths, prices, color tests and quality tests.
5. Laundry methods for silk and wool—effects of soaps and washing powders.
6. Study of laces and embroideries.
7. Care of clothing.
8. Clothing budgets.

### **II. Laboratory Work.**

1. Handling of wool material—making a wool skirt or simple dress.
2. Handling of silk material—silk smock or blouse.
3. Problem involving applied design, using some decorative stitch, etc.
4. Mending of wool and silk.
5. Thrift problem.
6. Cutting, fitting and finishing garments to include the following problems: Seams, hems, plackets, and button-holes for woolen and silk fabrics.

## **B. Nutrition**

### **I. Discussion Periods.**

1. Review of food principles.
2. Review of food digestion, and digestion of various foods, absorption and assimilation.
3. Relation of diet to health and disease—brief survey of recent discoveries in vitamins, prevention of rickets, etc.
4. Invalid cookery—fuel values, etc.
5. Dietaries for different types of people.
6. Study of commercial food products—butter, milk, egg substitutes, flours, etc.
7. Time and labor-saving devices.

## **II. Laboratory Work.**

1. Review of work of first year in meal planning, values, etc.
2. Dinner dishes—stock soups, meats, vegetables and salads, puddings, pastry, ices, gelatine dishes, bread.
3. Planning, marketing, preparing and serving dinners for families of adults and children.
4. Meals for infants.
5. Invalid cookery, dietaries, etc.
6. Cooking for special occasions—menus for larger quantities.

# MANUAL ARTS 1.

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## **Wood-work:**

This course includes drafting, cabinet work, wood-turning and carpentry.

Some industrial study and building construction should be considered in relation to the above. This may include a brief study of the lumbering industry; problems and processes entering into the manufacture of furniture; estimates of quantities and cost of stock for furniture and for a simple building; uses of steel square, and the simpler elements of building construction related to carpentry.

### (a) DRAFTING:

The use and care of drafting-room equipment; lettering and conventions; projection drawing, including sections; isometric drawing; detail and assembly drawing and complete drawings for a special piece of furniture to be made in the shop. In addition, a plan and elevations should be made for a shed or simple house.

### (b) CABINET-WORK:

To include the following elements of joinery: housed joint, keyed, mortice and tenon, haunched mortice and tenon, dovetail, and mitre joints, also rabbeting, grooving, assembling of parts, smoothing and finishing, fitting hardware and upholstering.

The work should consist of some simple models involving the elements of joinery, besides a more elaborate piece of furniture (such as table, chair, or desk). This piece should be designed by the student, and made from his own drawings.

### (c) WOOD-TURNING:

Simple spindle-turning and face-plate turning. Each boy should make at least one finished piece of work on the lathe, in addition to the necessary practice turning; it may be such a model as a chisel handle, candle-stick, ring, tray, or circular tabouret (or the turning may be included in a woodwork model, such as legs for a table).

### (d) CARPENTRY:

Each boy should have a part in some group work on a detail of building construction—as roof construction, window framing, door construction, stair-building. If a utility building be constructed under this head, the special piece of furniture mentioned under Cabinet-work may be omitted.



## MANUAL ARTS 2

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### **Metal-work:**

The course in metal-work is planned to include mechanical drafting, machine shop work, and *either* sheet metal work or forge shop work.

The metallurgy of iron and steel should be studied in connection with the forge work, including such topics as the following: ores and fuels; early smelting processes; the modern blast furnaces; Bessemer, open-hearth, crucible and electric processes; kinds and uses of steel; the steam hammer; modern methods of welding; manufacture and uses of sheet metals; tinning and galvanizing; brazing and soldering, and the characteristics and uses of other metals and alloys used in the shop, such as brass, bronze, copper, aluminum and babbitt.

#### **(a) DRAFTING:**

Projection drawing with particular application to metal-work. Working drawings of simple machine parts and of objects made in the shop.

Draw ellipse, spiral and helix, and objects showing their application. Represent types of screw threads, and typical bolts and screws, using conventional methods. Development of surfaces for sheet metal problems, including objects based on prism, cone, and cylinder, and the use of the triangulation method. Assembly and detail drawings of a special metal-working problem. Tracing and blue-printing.

#### **(b) FORGE SHOP:**

The simple process involved in the forging of iron should be illustrated in the making of useful articles. Emphasis to be given to the proper methods of building and keeping the fire, the heating of stock, and the use of blacksmiths' tools.

The course should include the following:

- (1) Drawing out and reducing stock to straight or taper forms; also bending and twisting.
- (2) Upsetting and heading, enlarging stock and localizing the upset; use of heading tool, swage, and set hammer.
- (3) Welding, including different kinds of scarfing and types of welds; welding heat and use of fluxes.
- (4) Bolt-making and nut-making, including use of taps, dies, drills; drill grinding.
- (5) Use of sheet-iron, including splitting, shaping, filing, punching, rivetting and assembling of parts.
- (6) Use of tool-steel and the making of small tools—as lathe tools, chisels, punches, scribes, etc.

- (7) Hardening and tempering—tempering baths and the methods of case hardening.
- (8) Typical models would probably include hooks, rings, chains, bolts, tongs, shovels, hinges or ornamental iron work and tools.

(c) SHEET METAL SHOP :

The sheet metal-work should include the following operations: cutting out material by use of snips and squaring shear; folding, rolling and forming; turning and wiring; burring and seaming; crimping, beading and grooving; raising; flanging; soldering and rivetting.

Suggested objects for construction are: biscuit and cookie cutters; cups and measures; pails, including cover and bail; pans; funnels, scoops, etc.

Instruction should be given on the several kinds and weights of material suited to different jobs, the various methods of laying-out work, and the economical use of material.

(d) MACHINE SHOP :

Practical bench work to include the uses of hammers, chisels, files, hack saws, scrapers and measuring tools.

Machine work to include the use of drill press, power hack-saw, grinder, speed lathe, engine lathe, and shaper. Instruction to be given on the use and care of machine tools and shop equipment, cleaning and oiling machinery, care and grinding of cutting tools, centering and chucking stock and the use of micrometer, protractor, and other measuring instruments.

Cast-iron, machine steel, and brass should be used in making simple useful models including the processes of straight and taper turning, thread-cutting, drilling and reaming, making running and driving fits, grinding, and shaping.

# MATHEMATICS

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## Introductory.

From the establishment of secondary schools to the present time, Mathematics has occupied a prominent place in the curricula. It has taken a position second only to English in the amount of time given to it. A programme of studies which did not include a considerable amount of Mathematics would be an anomaly.

## Courses.

The courses outlined in Mathematics are designed in the general schedule as follows: Algebra 1, Algebra 2, Algebra 3; Geometry 1, Geometry 2, Geometry 3; Arithmetic 1; and Trigonometry 1. Each of these is a one-year course and the numbers 1, 2, 3 indicate the first, second and third year's work, respectively, in each subject.

## Explanations.

The following brief explanations of the courses may be noted:

1. The portion of the work in Algebra, which is usually considered as Junior Algebra, is divided into Algebra 1 and Algebra 2, and is offered as a two-year course. The first year's work is obligatory in several of the courses and optional in others, while the second year's work is optional except in Matriculation courses.

2. Practical and Theoretical Geometry is offered as a two-year course. The first year's work, Geometry 1, is made obligatory in several of the courses and optional in the others, and is expected to be taken in the second year, but may be given in the first year. Geometry 2 is optional in all but Matriculation courses.

3. For students, other than Commercial, Arithmetic is limited to one year. The intention is that this be offered in the third year, but where the conditions existing in any particular school make it necessary, it may be taken a year earlier.

4. The advanced work in Mathematics is to be taken in the student's fourth year, and consists of Algebra 3, Geometry 3, and Trigonometry 1. As at present arranged, these are optional subjects.

## Aims and Values.

The study of Mathematics has both direct and indirect values, which are of sufficient importance to claim a considerable portion of time. Some of the direct values are:

1. The principles and processes of Mathematics are applied in affairs of life common to most people, whatever be their vocations. This may be seen in the almost daily use made of Arithmetic and the elementary principles of Algebra and Geometry.

2. In some of the professions and in some parts of certain vocations, a knowledge of the principles and processes of Mathematics is indispensable. The achievements of science and industry are the triumphs of civilization, and would have been largely impossible without the aid of Mathematics.

3. A knowledge of mathematical results, principles, and processes is required for work in the various sciences, mental and social, as well as material. The tendency at the present time is to reduce the relations existing between the forces and the phenomena of the other sciences to a mathematical basis.

The indirect values of Mathematics may be stated as follows:

1. The development of generally valuable concepts of number and space relations, which are fundamental elements in mental life, together with the development of certain mathematical thought modes.

2. An understanding of mathematical language as used in all fields of science, and frequently in newspaper and magazine articles.

3. The development of a scientific method of thought, such as the careful investigation of situations and causes, the necessity of obtaining accurate results, and the need of indicating clearly the different steps in the operation.

4. The abundant exercise of numerous valuable mental traits, the generalization of these traits, and the possible transfer of improved efficiency.

As pointed out in the General Introduction, transfer does not take place automatically, but the materials in teaching must be organized to produce the conditions that offer the most favorable opportunities for transfer. While the basis of transfer is found in the law of the normal processes of dissociation and generalization, yet certain factors may be arranged to foster and facilitate these processes.

Few subjects, if any, afford more opportunity for the exercise of valuable mental traits, most desirable to transfer, than Mathematics. The reasons for this are:

1. The materials of Mathematics range all the way from the simplest to the most complex, and permit of unlimited manipulations in teaching, thus permitting the arrangements of conditions most favorable to dissociation.

2. The material in the field of Mathematics has been organized from the start for purposes of teaching.

3. The certainty and accuracy of its data transcend those of all other subjects.

In the selection of the obligatory subjects, a minimum of Mathematics is made compulsory in all but the General Course. On account of the fact that all students have not the necessary abilities and capacities to make a success of this branch of study, they are permitted to elect other subjects, which are more suited to them. Sufficient Mathematics is offered, as compulsory, to determine whether the pupil has the ability and the desire to continue in the more advanced work.

# ALGEBRA

On leaving public school, the student should possess number concepts, a facility in the four simple processes, and considerable knowledge of the use made of these in the affairs of life. Algebra provides a new way of expressing quantities, gives a new and wider concept of number, and gives practice in the use of different mathematical processes in more complicated situations. It also furnishes him with a short and concise method of expressing mathematical ideas.

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## ALGEBRA 1

1. Relating notation of Algebra to practical problems of Arithmetic and Physics, thus introducing idea of Algebraic equations.
2. Discussion re negative number, illustrated by plotting points.
3. Specific drill on addition, subtraction, multiplication, and division.
4. Simple equations of one unknown.
5. Simple equations of two unknowns.
6. Solution of the quadratic by factoring.
7. Problems (practical) whose solution depends on one or two unknowns.
8. Factoring:
  - (a) Cross multiply.
  - (b) Difference of squares.
  - (c) Grouping.
  - (d) Difference and sum of cubes.
  - (e) Completion of squares.

9. Simplification of fractions by factoring and cancellation.

Text—Crawford: *High School Algebra*, to bottom of page 148.

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## ALGEBRA 2

1. Additions of fractions.
2. Fractional equations.
3. Evaluation of formulae.
4. Elementary quadratic surds.
5. Rationalization involving one root.
6. Indices—negative and fractional.
7. Quadratic—
  - (a) Solution  $ax^2+bx+c=0$
  - (b) Theory.
  - (c) Graphical solution of quadratic.



8. Graphs up to and including solution of simultaneous equations graphically, one of which is a quadratic.

Text—Crawford: *High School Algebra* (Macmillan Co.). Chapters XIII to XXIV inclusive with the following omissions:

- (a) Cube Root, *i.e.*, the section in Chapter XVII dealing with Cube Root.
- (b) Ratio and Proportion (Chap. XX).

*N.B.*—Chapter XII is *not* required for either Algebra 1 or Algebra 2.

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## ALGEBRA III

1. Arithmetic, Geometric and Harmonic Progression.
2. Ratio and Proportion, Variation.
3. Theory of Equations.
4. Miscellaneous Series.
5. Permutations and Combinations.
6. Binomial Theorem, positive, negative, and fractional indices.
7. Annuities.

Text—Crawford: *Senior High School Algebra* (Macmillan Co.), with the following omissions—Equations (Chap. I), (Chap. VII), (Chap. VIII, sections 65 to end of chapter); Inequalities, Maxima and Minima (Chap. IX), (Chap. X, sections 79 to end of the chapter), (Exercise 48 of Chap. XIII), (Chap. XIV, sections 121 to end of the chapter); Probability and Insurance (Chap. XV); Scales of Notation, (Chap. XVI).

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## ARITHMETIC 1

### Introduction.

In the course here outlined, it is intended to introduce some new methods and new matter, to emphasize the absolute necessity of accurate work, and yet to create and sustain interest in a subject that at this stage is in danger of becoming trite.

Proficiency in computation can be obtained only by constant drill. This drill cannot be obtained by the repetition of simple aimless calculations, but only by conscious self-drill in accuracy in connection with the production of meaningful and useful results. The operations involved should be constantly checked. The results should be shown to be reasonable answers to the problems in hand by the free use of approximation, and the degree of accuracy of the data used should determine the unit within which the result is supposed to be correct.

Algebraic equations, simple and quadratic, may be used to great advantage in the solution of arithmetical problems. There is no valid reason for not encouraging their use. In Mensuration, the truths of Geometry should be fully applied, and the evaluation of mechanical formulae is good practice in Arithmetic and of value to the work of Physics.

Arithmetic should be "practical," but the most practical teaching of Arithmetic is the teaching that produces accuracy in straightforward computation and whatever speed may be compatible with accuracy. Much of the difficulty in Arithmetic has arisen from the fact that a knowledge of process of construction and of business practice are assumed, with which a student has had no means of becoming familiar, and with which the great majority will never need to become familiar. It is wasted time trying to make the technicalities of business law and procedure, the ever-changing rules for measuring work, or the different processes involved in building, a necessary part of a course in general Arithmetic, or to make training in computation wait upon the acquisition of this knowledge.

The elimination of much elementary work allows for the introduction of a few new and more advanced sections of work. These include simple examples in logarithmic tables. Tables may be used both in simple and in compound interest. Ratio and proportion will include simple examples in variation, and mensuration should include drawing to scale.

It is advisable throughout that the exercises should be as far as possible problems of a useful nature, and that the principles dealt with should be freely used to solve industrial and scientific problems, provided the technical knowledge involved be such as is a matter of general information. Problems on construction would be natural applications of formulae in mensuration, and the examples in ratio and proportion would involve common laws of physics.

### **Course.**

1. Rules for checking.
2. Approximate results.
3. Contracted multiplication and division.
4. Ratio and proportion.
5. Square root, cube root by factors.
6. Mensuration :

Trapezium.

Similar triangles.

Sector or circle.

Cone and frustrum.

Pyramid.

Sphere.

7. Test of divisibility.
8. Longitude and Time.
9. Percentage :
  - Trade Discount.
  - Profit and Loss.
  - Commission.
  - Taxes.
  - Duties and Customs.
  - Insurance.

10. Interest:

Simple (with tables).

Bank discount (with tables).

Compound (with tables).

Present worth.

11. Partial payments.

12. Exchange.

13. Stocks and Bonds.

14. Equation of Payments.

15. Banking and Business forms.

Graphs.

16. Elementary treatment of logarithms with the use of logarithmic tables.

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## GEOMETRY

### Introduction.

The course in Geometry begins with a series of drawings of figures, to acquaint the students with the use of mathematical instruments, as the straight-edge, compass, protractor, etc., and through the use of these to teach them to construct and recognize simple figures as they are required.

The proofs of the propositions in Geometry will afford simple scope to the pupils for the exercise of their ability in logical thinking, and give them practice in reasoning from concrete figures, and in deducing generalizations from the concrete examples. Considerable use should be made of examples involving arithmetical calculations and algebraic formulae.

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## GEOMETRY 1

### Aims.

This course aims to give the students—

1. Facility in the use of geometrical instruments.
2. Knowledge of plane figures and their elements.
3. Practice in solving simple geometrical problems, including easy deductions.

### Course.

As outlined in Introduction and Books I and II of the authorized text, omitting Proposition 13, Book I.

Text—McDougall and Sheppard: *High School Geometry* (Copp, Clark Co.).

## GEOMETRY 2

### Introduction.

This course aims—

- (1) To continue the study of the properties of plane figures and the principles of plane Geometry, with simple exercises.
- (2) To give training in the definition and solution of geometrical problems, both theoretical and concrete. Theoretical proofs will be required on all of the work of this course.
- (3) To provide the geometrical knowledge and secure the technique required for more advanced Mathematics, *e.g.*, Trigonometry, Elementary Calculus.
- (4) To train the pupils to use these geometrical principles in the solution of problems of immediate personal interest in the school and home, and in correlated sciences.

### Course.

Books III and IV of the authorized text, omitting Prop. 15, Book IV.

Text—McDougall and Sheppard: *High School Geometry* (Copp, Clark Co.).

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## GEOMETRY 3

### Aims.

The course in Analytical Geometry gives the student an opportunity to apply the principles that he has previously learned in Geometry and Algebra, and to interrelate geometrical figures and algebraical formulae. It also gives him some knowledge of plane curves other than the circle. By a similar treatment of the circle, ellipse, parabola, and hyperbola, their similarities and differences may more readily be recognized.

### Course.

The authorized text—

McDougall and Sheppard: *Analytical Geometry for High Schools*, with the following omissions:

- Section 56.
- Sections 71- 81 inclusive.
- Sections 111-117 inclusive.
- Sections 137-139 inclusive.
- Sections 159-164 inclusive.

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## TRIGONOMETRY

Trigonometry is a one-year course and is an optional subject of the fourth year. The foundation of Trigonometry is laid in the number work of Arithmetic, in the manipulation of symbols

and expressions of Algebra, and in the results obtained from the study of Geometry. The subject furnishes an opportunity to organize and apply many of these mathematical principles, and to give them a new and attractive setting which, to a student with a capacity for Mathematics, results in an added interest. A chief aim in the course is to secure accuracy and precision in thought and in the operations performed.

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## TRIGONOMETRY 1

Text—Conant: *Plane Trigonometry* (American Book Co.), omitting Chapters X, XI, and XIV.



# MUSIC

No outline in instrumental Music has been prepared. The Department will accept the certificates of examining boards as set out below as complete credit in Music 1, 2 and 3.

## REQUIREMENTS FOR CREDIT IN MUSIC

### MUSIC 1.

### MUSIC 2.

### MUSIC 3.

Examining Boards	Practical	Theory	Practical	Theory	Practical	Theory
University of Toronto (Toronto Conservatory)	Junior Grade Examination	Primary Theory	Intermediate School Examination	Primary Theory	Intermediate Grade Examination	Junior Theory
McGill University (McGill Conservatory)	Intermediate Grade Examination	Junior Grade Theory	Senior Grade Examination	Intermediate Grade Theory	Highest Grade Examination	Senior Grade Theory
Associated Board	Higher Division Examination	Grammar of Music III or Rudiments of Music	Intermediate Grade Examination	Harmony Lower Division	Advanced Grade Examination	Harmony Higher Division

N.B.—Candidates who prefer may write on the Departmental papers in Theory of Music 1, 2, and 3 in lieu of presenting the documents in Theory noted above. For details see next page.

Students who have completed the practical work as outlined on the preceding page may, if they prefer, write Departmental papers on Theory in lieu of the examinations mentioned in the table.

The requirements in Theory for the Departmental examinations are outlined below :

MUSIC 1. A knowledge of staves, G and F clefs, notes, dots, rests, leger lines, time signatures, Key signatures. Writing of scales, both major and minor, in any Key. Transposition of short sentences to other Keys and from treble to bass or *vice versa*. Completing bars with notes or rests in any kind of time. Marks of expression. Technical names of scale degrees (tonic, super-tonic, etc.). Common chords, intervals and their inversions. One question will be given on harmonizing a simple figured bass using the common chord and its inversions.

MUSIC 2. A knowledge of the C clefs (alto and tenor only) by transposition of sentences from bass and treble clefs. All major and minor scales. The melodic and harmonic mode of writing the chromatic scale. Triads, common chords, and their inversions. The dominant seventh chord and its inversions and resolutions. Harmonizing of a figured bass containing two or three examples of the dominant seventh and its inversions. Adding the bass, alto, and tenor parts to a simple melody. Cadences and simple sequences.

MUSIC 3. More advanced questions based on the outline in Theory for Music. Modulation to nearly related Keys. Harmonizing a simple melody. Adding three upper parts to a figured bass. Diatonic passing notes.

Questions on important facts in the life and work of Bach and Beethoven.

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## PHYSICAL EDUCATION

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A tentative course in Physical Education has been prepared and may be had on application to the Department. Approximately eighty minutes per week should be reserved for Physical Education throughout the four years.

# SCIENCE

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## General Introduction.

There have been three stages in the development of science teaching in High Schools. At first, science courses were taught as informational subjects, with but little laboratory work, and but slight reference to the economic, industrial, social, and hygienic applications. During this period a number of sciences of questionable value in secondary schools were introduced, such as astronomy, meteorology, and geology. In the second stage, the science was studied as an end in itself, a laboratory technique was developed, and the student was expected to be interested in the work because it was a recognized field of research. This was the period of the pure science teaching. In the third stage, the student continues his laboratory practice, but gives much more attention to the applications of the scientific knowledge acquired, to the problems of everyday life. The danger, at this stage of evolution, is that teachers and students may neglect the methods and principles underlying the sciences, and become engrossed in the applications of these facts. If this were to happen, then we should be in danger of relapsing to the informational phase, the only change being one of content. Whereas formerly we gave pupils a knowledge of principles, rules, formulae, and laws, now we are in danger of giving them ready-made explanations of facts, thus inhibiting any tendency on their part to discover explanations for themselves. In order to prevent this, all the courses outlined call for laboratory and experimental treatment.

## Courses Offered.

The science courses prescribed for secondary schools are as follows:

1. General Science, one course.
2. Physics, two courses.
3. Chemistry, two courses.
4. Agriculture, two courses.
5. Biology, one course.
6. Geography, one course.
7. Physiology and Hygiene, one course.

The general principles governing the selection, arrangement, and content of the courses may be set forth briefly.

1. A General Science course is to be given in the first year. This has been designed as introductory to all the special sciences. It will give the student some practice in experimental methods, and will provide the large number who leave High School at the end

of the first year with some knowledge of the fundamental facts of natural processes.

2. It is a generally accepted policy, in all school systems, to place Physics at an earlier stage in the school curriculum than Chemistry. The first course in Physics is being drafted for second year students, and the first course in Chemistry for third-year students. The second courses in each subject are written for students of the fourth year.

3. The study of Biology has been postponed to the fourth year, in order that an intensive course in pure science might be given.

4. Agriculture is to be offered for two years. The courses in Agriculture are interrelated in such a way that the student who selects the first year of Agriculture must select the second course in the following year. Project work is to be undertaken in the spring at the end of the first year, and it is provided that a portion of the work of the following autumn will be based on the results obtained in these projects. This is the only course in the entire program for which such a regulation prevails, but it has not been possible to arrange satisfactory courses in Agriculture which did not require the placing of this restriction.

5. Geography will be offered for one year. The course as outlined is predominantly industrial and commercial.

6. Physiology and Hygiene are to be given for approximately forty minutes per week, throughout the first two years of High School.

### **Aims and Values.**

The direct values of scientific studies are numerous, but those of paramount importance are as follows:

1. There is a minimum of scientific knowledge which is indispensable to every human being in a civilized community today. This minimum may be defined as that amount which enables him—

- (a) To maintain life and health; or at least to know the factors which tend to endanger these;
- (b) To prepare himself to carry out efficiently the duties of a parent, in so far as this preparation is dependent on a knowledge of biological, physical, and chemical processes;
- (c) To appreciate the increasing importance to our civilization of exact scientific knowledge, and to realize the need for society to make adequate provision for the continuation of research in every department of human activity;
- (d) To use to advantage the results obtained by specialists and research workers;
- (e) To understand some of the natural phenomena with which he comes in daily contact, and to see in them the normal working out of physical and chemical laws.

2. For a limited group of students, the study of Science in the secondary school is an essential part of their vocational preparation.

3. For an even more limited group, scientific training in secondary schools is preparatory to more intensive scientific studies in higher institutions.

4. Science courses provide situations which may be utilized to assist in the development of habits of accuracy. It is often, but incorrectly, claimed that sciences differ greatly from any other subjects in this respect; their value is, rather, supplementary; and unless care is taken by teachers, these habits need not be generalized or applied to other fields of action.

5. In common with other subjects, Science may be used as a means for the development of a scientific method of study. Here, again, the method will be generalized only when the teacher is careful to require it. There may be some transfer of training from one Science to another in cases in which there are identical elements.

Exactly what abilities and capacities are required for excellence in Science is not yet known, but it is probable that a considerable number of students will be found in the secondary school who are not adapted to Science study, and who should be directed to what are, for them, more satisfactory branches of study. A minimum of Science work has been prescribed to allow for this adaptation to individual differences, innate and acquired.

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## AGRICULTURE

### Introduction.

That the High School curriculum should more and more intimately reflect the interests and needs of the province has been a dominant principle in the mind of the Department in authorizing the adoption of new courses of study. This meant that an earnest effort must be made to outline suitable work in scientific Agriculture. To meet this need as fully as possible, the new program of studies provides for an agricultural course, in which special emphasis is placed on scientific studies that are basic to Agriculture. It is hoped that a considerable number of schools will make provision for this course.

The two years of work in Agriculture, outlined below, cover all the material which it seems possible for the great body of our schools to provide. In Agriculture 1, it is intended that the teacher shall present to pupils the fundamental facts of plant and insect life, in so far as these are relevant to Agriculture, and lead them to realize the reason for certain practices of good farmers as regards the treatment of soil and seed beds. The presentation should be accompanied by experiments and demonstrations, and the teacher should encourage home projects, under the supervision of the school. Exhibits should be provided at the school or district fair. School collections of plants and insects should be made.

Agriculture 2 represents, in very large part, an attempt to introduce some direct agricultural training into the schools. School collections should be continued for use in the teaching of Agronomy.



The purpose of the section on Animal Husbandry is to provide that each child shall know the more common types of live stock in Alberta, and shall know the relative values to Alberta farmers of each type of breed.

It is advisable that all pupils who are taking Agriculture 1 should take Agriculture 2. Home projects should be started with pupils in the spring near the end of the first course, and be completed by pupils in the autumn of that year.

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## AGRICULTURE 1

*N.B.*—Seasonal sequence should be followed rather than that followed in the printed course.

### General Divisions:

#### I. Agricultural Biology:

- (a) Botany and Horticulture.
- (b) Zoology.
- (c) Practical Bacteriology.

#### II. Soils.

### Agricultural Biology

#### I. Botany and Horticulture.

##### (a) A laboratory course dealing with:

- (1) Function of parts of plants.
- (2) Plant propagation.
- (3) Germination, transplanting, etc.
- (4) Food storage in plants—
  - (i) Tests for starch, sugar, protein and oils.
  - (ii) Modification of parts of plants for food storage.
  - (iii) Change in position of stored food as plants ripen.

##### (b) Gardening:

- (1) Garden vegetables, selection of seed, preparation of seed bed, transplanting, thinning, cultivation during growth, hot-bed and cold-frame, storage and marketing.
- (2) Currants, gooseberries, berries and other small fruits that may be grown in Alberta—planting, cultivation, pruning, relation to shelter belts, marketing.
- (3) Selection and care of shrubs and annual or perennial plants for lawn or house decoration.
- (4) Shelter belts: Trees adapted to Alberta conditions—preparation of soil, planting, cultivation, value.

##### (c) General Economic Botany:

- (1) Plant Ecology—Economic plants of garden and field.
- (2) Plant selection—Variation and improvement.

- (3) Fungi:
  - (i) Cultivation of economic fungi.
  - (ii) Injurious and parasitic fungi which attack vegetables, shrubs and trees.
  - (iii) Fungicides and mode of application.
- (4) Plant identification:
  - (i) Weeds, economic plants of garden and field.
  - (ii) General characteristics—common grains, grasses and leguminous plants.

(d) School collections and home projects.

## II. Zoology.

- (a) Insects:
  - (1) Study of insect characteristics and life histories, selections as types—grasshopper, butterfly and fly.
  - (2) Injurious insects of garden and field.
  - (3) Beneficial insects.
  - (4) Classification as biting and sucking insects.
  - (5) Insects which attack vegetables, shrubs and trees, and modes of combating them—insecticides.
  - (6) The balance of nature—conditions leading to insect pests.
- (b) Birds:
  - (1) Study of plumage, bills, feet.
  - (2) Classification:
    - (i) Carnivorous, insectivorous, germinivorous.
    - (ii) Beneficial and injurious.
    - (iii) Classes of birds domesticated.
- (c) Mammals:
  - (1) Study of body-covering, teeth, feet.
  - (2) Classification—
    - (i) Wild;
    - (ii) Domesticated mammals.
  - (3) Domestication.

## III. Practical Bacteriology.

- (a) Bacteria and fungi in relation to household problems, viz., (1) yeast (2) ferments (3) milk souring and pasteurization (4) butter-making, cheese-making and refrigeration (5) contamination of dairy products (6) preservation of fruits (7) contagious and infectious diseases—experiments with cultures (8) economic fungi and fungicides.
- (b) Soil bacteria:
  - (1) Soil and seed inoculation.
  - (2) Nodules on roots of leguminous plants.
  - (3) Nitrifying and nitrogen “fixing” and denitrifying bacteria.
  - (4) Conditions favoring activity of useful bacteria.

# AGRICULTURE 2

## General Divisions:

- I. Soils.
- II. Agronomy.
- III. Animal Husbandry.
- IV. Planning a farm home.
- V. Marketing.
- VI. Farm Machinery.
- VII. The Industry of Agriculture in Canada.
- VIII. Projects.

## I. The Soil.

- (a) Physical and chemical tests relating to soil constituents, *e.g.*, clay, sand, humus, alkali, acid, lime, phosphorus, potassium, etc.
- (b)
  - (1) Classification of soil based on proportions of constituents.
  - (2) Characteristics of types studied in (1).
  - (3) Soil and sub-soil. Points of similarity and of difference physically, chemically and in relation to plant growth. Renewal of soil by materials from sub-soil.
- (c) Agencies of soil formation and their physical or chemical effects—water, glaciers, heat, frost, winds, leaching and atmosphere.
- (d) Soil moisture.
  - (1) Kinds—free, capillary, hygroscopic.
  - (2) Moisture capacity.
  - (3) Movements of soil moisture—capillary action—rate of percolation, etc.
  - (4) Relation of free and capillary moisture to plant growth.
  - (5) Evaporation—Factors affecting rate of evaporation. Methods of conserving soil moisture.
- (e) Air in soils.
  - (1) Air capacity.
  - (2) Sweetening of soils.
  - (3) Importance of plants.
- (f) Soil Temperature.
  - (1) Relation to moisture content.
  - (2) Relation to cultivation.
  - (3) Relation to germination and root development.

## II. Agronomy.

- (a) A study of the types of soil in relation to:
  - (1) Methods of cultivation.
  - (2) Methods of conserving moisture and the amount of moisture needed for each kind of crop.
  - (3) Crops.
  - (4) Prevention of soil drifting.

- (b) (1) Kinds of crops :
  - (i) Green crops.
  - (ii) Hay and pasture.
  - (iii) Crops for silage—corn and sunflower.
  - (iv) Root crops.
- (2) The following points will receive attention in connection with the crops in (b) (1) :
  - (i) Selection and preparation of the seed.
  - (ii) Preparation of seed bed.
  - (iii) Cultivation during plant growth.
  - (iv) Harvesting and storing of the crop.
  - (v) Crops suitable to the different parts of Alberta.
  - (vi) Crop rotation.
  - (vii) Economic value of the crops in (b) (1).
- (c) Soil Fertility :
  - (1) Loss of soil fertility due to cropping, weeds, denitrifying, bacteria, erosion, soil drifting, etc.
  - (2) Soil fertility increased by suitable manure, green manures, leguminous plants, nitrifying bacteria, nitrogen-gathering bacteria, commercial fertilizer, etc.
  - (3) Methods of application of manure and of soil cultivation to stimulate bacteria activity.
- (d) Weeds :
  - (1) Identification of common field weeds.
  - (2) Methods of eradication.
  - (3) Loss of soil moisture and of soil fertility through the growth of weeds.
  - (4) Labor cost of weed eradication.
- (e) Insects, rusts and smuts which attack field crops. Mode of treatment.
- (f) Irrigation :
  - (1) Methods of applying water to soil.
  - (2) Irrigation during the period of plant growth and fall irrigation.
  - (3) Crops suitable to irrigated farms.
  - (4) Relation of irrigation to intensive and mixed farming.

### **III. Animal Husbandry.**

- (a) Cattle :
  - (1) Breeds of cattle—Shorthorns, Herefords, Angus, Holsteins, Ayrshires, Jerseys—leading characteristics.
  - (2) Comparison of beef and dairy types.
  - (3) Stock feeding—suitability of feeds—roughages and concentrates—selection and combining of feeds for economy and efficiency.
  - (4) Types of stables and shelters.

(b) Dairy :

- (1) Care of cattle and stables.
- (2) Silos and silage.
- (3) Care of milk to prevent contamination.
- (4) Herd records and Babcock test.
- (5) Marketing of Milk, cream and butter.

(c) Horses :

- (1) Breeds—Clydesdales, Percherons, Belgians, Thoroughbreds and Standard-breds—characteristics of each type—uses.
- (2) Feeding and care on ranch and farm.

(d) Sheep :

- (1) Breeds—Shropshires, Oxfords, Hampshires, Merinos—characteristics of each type.
- (2) Care of sheep on ranch and farm.
- (3) Suitability of each type to Alberta conditions.
- (4) Value of each type for mutton and wool production.
- (5) Co-operative grading and marketing of wool.

(e) Hogs :

- (1) Breeds—Berkshires, Yorkshires, Durocs, Tamworths—characteristics of each type.
- (2) Characteristics of “bacon” type.
- (3) Feeding and care.

(f) Poultry :

- (1) Breeds—Barred Rocks, Leghorns, Rhode Island Reds, White Wyandottes, etc.—characteristics.
- (2) Care, management and feeding.
- (3) Egg-laying competition.
- (4) Crate fattening.
- (5) Comparison of breeds from various market standpoints.
- (6) Marketing of eggs and poultry.

#### **IV. Farm Homes.**

Planning of homes showing arrangement of house, lawn, garden, shelter belts, barns, stables, stiles, poultry houses, etc.—aesthetic arrangements, convenience, sanitation.

#### **V. Marketing.**

- (1) Standardizing of products.
- (2) Variation of products to meet requirements of markets.
- (3) Cost of marketing.
- (4) Co-operative marketing.

#### **VI. Farm Machinery.**

Types—uses and care.



## VII. The Industry of Agriculture in Canada.

- (a) Order of Magnitude, compared with—
  - (1) Manufacturing—numbers employed; value of product.
  - (2) Mining—numbers employed; value of product.
  - (3) Fishing—numbers employed; value of product.
- (b) Number of Farms in Canada :
  - (1) Average size of farms in various provinces.
  - (2) Average amount of cultivated land.
  - (3) Total acreage under cultivation, by provinces.
- (c) Number of Cattle, Horses, Swine, Sheep, and Poultry, on Canadian farms.
  - (1) By provinces.
  - (2) Compared with figures of ten years before.
- (d) Chief Products of Canadian Farms, in order of value :
  - (1) Wheat.
  - (2) Barley.
  - (3) Meat.
  - (4) Cheese.
  - (5) Wool.
  - (6) Fruit, etc.
- (e) Chief Agricultural Exports :
  - (1) Wheat and Flour.
  - (2) Bacon.
  - (3) Fruit.
  - (4) Cheese.
  - (5) Butter, etc.
- (f) Importance of Agricultural Exports compared with other Products :
  - (1) Wood products.
  - (2) Minerals.
  - (3) Manufactures, etc.

For information see Canada Year Book and Census reports.

## VIII. Projects.

### A. Weather Chart Project:

Since weather plays such an important part in the growing of our crops, the keeping of a daily weather chart becomes a very practical part of our equipment, either in the school or at home. The longer the period covered by the weather chart, the more valuable the chart becomes as a reliable reference for both crop-growers and agricultural students. There are a variety of forms that these weather charts may take, but the following example, which is taken from the records kept continuously for seven years by the pupils of a rural school in Northern Alberta became a trustworthy guide for that locality.

A section of this chart, covering a week in the Spring of 1922, will show how it was arranged.

Date	Direction of Wind	Kind of Day	Temperature	Observations
Monday, May 8/22	S.W.	Bright	50-62°	¼" ice on water troughs. Violets are out. Showers last night with thunder and lightning.
Tuesday, May 9/22	N.E.	Cloudy	46-55°	Heavy rain has stopped seeding. The first oats are up.
Wednesday, May 10/22	N.W.W.	Cloudy	47-54°	Very muddy roads, slight rain last night. Young Woodpeckers seen. Birch trees are in leaf.
Thursday, May 11/22	N.W.N.	Fair	45-55°	Duck's nest with nine eggs, and a robin's nest with two eggs. Slight frost last night. Cars are running and seeding has started again. Wheat, oats, peas, corn, potatoes and carragana seeds were planted in the School garden today.
Friday, May 12/22	N.	Cloudy	44-49°	A cold drizzling rain lasted all day. Poplar trees are in leaf. Post-holes three feet deep show water this year but were quite dry last year.

A week's record taken from a weather chart made in 1921 brings out the following points:

Date	Direction of Wind	Kind of Day	Temperature	Observations
Monday, July 11/21	N.	Cloudy	66-72°	Timothy in bloom, Marquis and Huron headed out. Raspberries, gooseberries and saskatoons are ripe. A strong wind brought a slight rain last night.
Tuesday, July 12/21	S.W.S.	Fair	69-72°	Victory Oats headed out. A severe hailstorm swept all the crops over a 20-mile strip to the south of here yesterday afternoon.
Wednesday, July 13/21	N.W.	Bright	69-81°	Very slight rain last night, with heavy hail in some places. Gophers are moving into the fields and gardens and are doing considerable damage.
Thursday, July 14/21	S.E.E.	Bright	76-82°	Banner Oats, Black Oats, Gold Rain Oats and Emmer are headed out. Premost Flax is in bloom.
Friday, July 15/21	S.E.E.	Hazy	76-79°	Very sultry, both day and night. Wild fruits are drying up for want of a heavy rain.

The equipment needed for this type of weather chart is not very extensive, as a good wind vane, a flag or the smoke from chimneys will give the direction of the wind, and a fairly reliable thermometer will enable the two daily readings to be taken. The thermometer may be read at the morning and afternoon recesses, or at 9.00 a.m. and 4.00 p.m.

This project should be started when school opens in September and carried through until the end of the term in June. The

students should make their own observations and these should be checked by the teacher to secure accurate and uniform results.

By looking back over these weather charts, a student or crop-grower should be able to judge what conditions are essential to produce a good crop, and how many frost-free days there are from year to year during the growing season in his district. He should also be able to compare the seeding, haying and harvesting conditions of one year with those of others. These and a great many other definite and practical facts may be read from a weather chart that is conscientiously kept over a long period.

## **B. Field Crops Project:**

The early Fall term is a suitable time for making a collection of the main cereals, grasses, and clovers grown in your district. This may be done in either of the following ways:

(1) Select enough clean, straight stalks with well-filled heads to make a neat little sheaf, about one and a half inches thick at the middle. Strip off any superfluous leaves and arrange the stalks neatly with the central stalks slightly higher than those around the outside of the sheaf. Do not tie the sheaf too tightly until the stalks are all fairly well cured. Then tie in three places with colored ribbon or cord and trim off the bottom of the sheaf squarely.

(2) The second method is as follows: Mount single specimen heads and part of the stalk of each variety of grain or grass on a suitable cardboard mount. Take about twelve seeds from another head of the same variety and mount them in a small patch of mucilage near the base of the stalk on the mount. Several specimens may be arranged on the same mount.

Whether you adopt the small sheaf or the single specimen method, care must be taken to select only the best samples. Each variety should be clearly labelled.

The following varieties should be included in the collection:

### *Cereals:*

Wheat—Marquis, Red Fife, Renfrew, Garnet.

Oats—Banner, Victory, Abundance.

Barley—O.A.C. No. 21, Manchurian, Barko, Chevalier.

Rye—Either Spring or Winter Rye.

Flax—Premost.

### *Grasses:*

Timothy, Brom Grass, Red Top, Western Rye Grass, and Hungarian Mille.

### *Clovers:*

Sweet Clover, Red Clover, Alsike Clover, and Alfalfa.

## **C. Insect Project:**

Review the section in your text which deals with insects, paying particular attention to grasshoppers, cutworms, wireworms, wheat-stem sawflies, Colorado (potato) beetles, cabbage root maggots, currant maggots and warble flies.

Make drawings or secure pictures which will show clearly the distinct steps in the complete life cycle of each of the above insects.

Leave plenty of room, so that your drawings or pictures will not be unduly crowded. There should also be enough space left beneath each drawing or picture for a brief description of the different stages in the life cycle of each insect as well as methods suggested for its control.

You may do this project in still another way. Secure the actual specimens of the above insects out in the grain field or garden in the late Summer or Fall, and then try to get the earlier stages. Use a killing bottle and a convenient spreader to prepare the insects for mounting. Glue thin slices of cork to the bottom of a cigar-box or candy-box that can be made mothproof. Paste the labels with a brief summary of each insect's life history beneath the insects in the box.

#### **D. Publications Project:**

There are a great many excellent agricultural bulletins and pamphlets available from a great number of sources. Many of these publications should be in the hands of every farmer and student of agriculture in Western Canada, because they contain some very helpful practical knowledge that could be put to immediate use in either school or home.

For that reason, a project has been suggested that should help to make both students and teachers, as well as farmers, familiar at least with the sources of this information, which is still available, in most cases, on request.

Write to the following addresses and ask that a complete list of their agricultural publications be mailed to you:

Department of Agriculture, Ottawa, Ontario.

Department of Agriculture, Edmonton, Alberta.

Department of Agriculture, Toronto, Ontario.

College of Agriculture, Edmonton, Alberta.

College of Agriculture, Saskatoon, Saskatchewan.

College of Agriculture, Winnipeg, Manitoba.

International Harvester Co., Chicago, Illinois, U.S.A.

United States Department of Agriculture, Washington, D.C., U.S.A.

*N.B.*—Not more than one set of bulletins should be asked for by each school.

After you receive their lists, check over the names of the bulletins you require for the following sections, and send for them.

When they finally reach you, classify them under these main headings for convenience in looking up information: Field Crops; Animal Husbandry, including sub-sections dealing with Horses, Cattle, Sheep, Hogs, and Poultry; Farm Buildings; Dairying; Soils and Fertilizers; Horticulture; Entomology; and Household Economics.

Besides the above addresses, there are a great many agricultural colleges and experimental stations in the Western United States, where some very practical publications may be secured. Many of these are directly applicable to agricultural conditions in Western Canada and are in many cases very well illustrated.



## E. Poultry Project:

Poultry-keeping is rapidly becoming a very important part of most mixed farming schemes in Alberta. The encouragement and assistance from Dominion, Provincial and other sources have proved most effective in establishing this growing industry on a sound economic basis. A poultry project should, therefore, provide some practical exercises for Alberta's students.

The project will be divided into two sections:

### *Section 1:*

Secure pictures of the common breeds of farm poultry from agricultural bulletins, farm journals, papers, advertisements, and other sources, and paste them neatly in the Project Notebook. Leave plenty of space beneath each picture for the name of the breed and a brief summary of its outstanding characteristics.

The following common breeds of farm poultry should be shown in your notebook:

*Fowl*—Barred Rocks, White Leghorns, Brown Leghorns, Rhode Island Reds, White Wyandottes, Orpingtons, and Minorcas.

*Turkeys*—Bronze, and White Holland.

*Geese*—Toulouse, Embden, and African.

*Ducks*—Pekin, Rouen, and Indian Runner.

### *Section 2:*

*A Plan of a Permanent Laying House for Winter Egg Production.* Use a convenient scale and draw a plan of what would be considered a convenient hen-house that would suitably withstand Alberta winters and comfortably house one hundred and twenty-five laying pullets. Show the following features distinctly in your plan:

- (a) Position and sizes of door and windows (glass, cotton or cello-glass).
- (b) Type of roof.
- (c) Height of walls.
- (d) Construction of floor.
- (e) The position and dimensions of the nests, roosts, and dropping-board, feed supply bin, self-feeder and water-stand.

## F. Farm Machinery Project:

Alberta covers an extensive area and the types of farm machinery in use necessarily vary as you move from south to north. It is, therefore, impossible to give much more than a few suggestions as a guide in carrying out this project. Each student will have to treat this subject as it applies directly to a particular district.

Pictures of the various farm machines used in the district should be cut from the advertising booklets supplied by all machine companies. These should be pasted neatly in one section of the Project Notebook. The name, with a brief description of the use of each implement should be neatly written, typed or printed beneath each machine.



A logical arrangement may be secured by showing the farm implements in the order in which they naturally come into use, beginning with the breaking of the virgin prairie soil, passing through the various cropping processes, and finally completing the scheme with the machinery used to harvest the various grasses or grains. It is a good policy to leave plenty of space for an exhibit of this sort, as overcrowding defeats the purpose of the project and discounts its practical value.

### G. Animal Husbandry Project:

Each student in Agriculture should become familiar with at least the common breeds of cattle, horses, sheep and hogs raised in Alberta. It is very seldom that one has the opportunity of seeing all these breeds of livestock at any one place and time, and of making a careful study of the outstanding characteristics of each. However, the livestock exhibits at the larger fairs or the nearest experimental farm may show a great many of them.

Reserve a fairly large part of the Project Notebook for Animal Husbandry. Be on the watch for pictures of the different breeds in livestock bulletins, journals and stockbreeders' advertisements. Cut these out and paste them carefully in the notebook, along with any photographs of some of the breeds at fairs, experimental farms, or in the field. Set the pictures in some geometric arrangement that will leave a space beneath them for the names of the breeds with their chief characteristics. Tabulate this brief summary rather than write it out in complete sentences. Arrange the pictures so that in the cattle group a beef type and a dairy type will be close together, that the difference in form between the two types may be studied. Similarly, a bacon hog should be placed opposite a lard hog, for purposes of comparison.

The following common breeds of Alberta farm animals should be shown:

*Cattle*—Shorthorns, Herefords, Angus, Holsteins, Ayrshires, and Jerseys.

*Horses*—Clydesdales, Percherons, and Belgians.

*Sheep*—Shropshires, Oxfords, Hampshires, Southdowns, Leicesters, and Merinos.

*Hogs*—Berkshires, Durocs, Tamworths, and Yorkshires.

### H. Farm Planning Project:

In order to cover satisfactorily the diversified conditions existing in Alberta, three alternatives are offered in this project.

(1) Draw a plan to some convenient scale showing how a quarter-section or a half-section of land may be conveniently irrigated. Show the main ditch that supplies all the water for the irrigation of the farm, as well as the lateral ditches which distribute the water. Show on your plan, as well, whether you have used one of the three free-flooding systems or the furrow system. Print neatly and clearly the names of the crops grown on the different parts of the farm.

(2) Choose some suitable scale for a plan of a section, a half-section or a quarter-section of farm land. Show how you would lay out the building site, the fields, fences and lanes to make a practical

arrangement that would prove economical when you consider such primary factors as distance and direction from town, proximity to main travelled highways, the topography of the land, shelter, water supply, drainage, and the nature and variation of the soil.

(3) Draw to some definite scale a plan of a farmstead of six acres. Show how you would arrange all the buildings, corrals, calf-pasture, hog-pasture and poultry-run, giving the distances of each from the road. Fix the position of the shelter belts, lawn, gardens, well, paths and driveways. Follow a natural arrangement rather than a geometric plan in laying out your shrubs and flower beds around the house.

### **I. Soil Project:**

(1) Give a careful, concise explanation of each of the following:

- (i) Surface or top-soil.
- (ii) Subsoil.
- (iii) Difference between top-soil and subsoil and the relation of one to the other.
- (iv) The different types of alkali soils with the characteristics and economic importance of each in Western Canada.
- (v) The classification of soils, showing the characteristics as well as the values of each kind in crop production.

(2) Soil Exhibit.

Thoroughly wash and dry some common fruit jars. In order to secure fairly representative soil samples that will show what your surface soil and subsoil are like, you will first of all have to carefully remove the surface or top soil from two areas, one on top of a hill or knoll and the other in a valley in one of your fields. Fill the lower parts of two jars with subsoil taken from these two places and then carefully fill up the remainder of the jars with the surface soil taken respectively from the valley and the hill or knoll. This will show any difference that may exist between the subsoil in the valley and that on the hill, and it may show, as well, any variation in the depth or character of the surface soil in the two areas. This work must be done carefully in order that the true relation of the subsoil and surface soil may be preserved.

One may compare sand and clay subsoils in this way or the great variation that occurs between woodland or swamp soils and parkland or prairie soils. In all cases the jars should be carefully labelled, showing the origin of the soil, along with the depth of the surface soil as it exists in the field, along with any other information of interest. The light-colored subsoil and chocolate loam of South-eastern Alberta make a striking contrast when placed alongside of the yellow clay subsoil and black loam surface soil of Central Alberta.

# BIOLOGY 1

## Introduction.

The course in Biology is primarily a course in pure science, and includes a study of the leading divisions in the animal and plant kingdoms. An intensive study is to be made of typical representatives, and a more general study of related forms, with a view to discovering the chief characteristics of each division. The Morphology and Physiology of plants is stressed, and requires extensive experimental and microscopic work. In Zoology a fairly complete life history of each type studied is presented and includes: Food habits; mode of locomotion; sense organs and nervous system; processes of digestion, circulation and respiration; environmental relationship. The adaptation of plants and animals to their surroundings is stressed throughout the course.

## I. Morphology, Physiology and Ecology of the Parts of the Plant.

### (a) Root:

- (1) The classification according to (I) Origin, (II) Form, (III) Habitat.
- (2) The structure of the root.  
Microscopic study of cross-sections and longitudinal sections of the root and of the root tip.
- (3) Adaptations of roots and their modifications for special adaptations; *e.g.*, soil roots, aquatic roots, aerial roots, etc.
- (4) Functions; experiments on absorption, geotropism, hydro-tropism, aeration, root pressure, root hold.

### (b) Stem:

- (1) The classification of stems according to (I) Kind, (II) Habitat.
- (2) The structure of the stem.  
Microscopic study of cross-sections and longitudinal sections; study of plant tissues, bundles, etc.  
Microscopic study of stems of dicotyledons and monocotyledons.
- (3) Growth in stems, in diameter, in length.
- (4) The study of buds and spines.
- (5) Stem adaptations and modifications for special conditions.
- (6) Experiments in heliotropism, conduction of sap, rate of growth, the healing of wounds, girdling.

### (c) Leaf:

- (1) The classification of leaves.
- (2) Venation; phyllotaxy.
- (3) The structure of the leaf.  
Microscopic study of cross-sections of the leaf, showing all the tissues and structures.
- (4) Photosynthesis and assimilation—light relations and adaptations; food products; translocation; assimilation.
- (5) Moisture relations—transpiration, adaptations for its control; wilting; protection from rain; adaptations of leaves for an aquatic environment.

- (6) Respiration—stomata, lenticels; respiratory needs of the plant.
  - (7) Modification of the leaves.
  - (8) Other parts of the plant possessing the functions of leaves.
  - (9) Experiments to show respiration, transpiration, the effects of light, wilting.
- (d) Flower:
- (1) Parts of flowers; the function and arrangement of the parts.
  - (2) Pollination—the study of pistils, stamens and the pollen of plants; adaptations for pollination by wind or by insects. Adaptations to prevent self-pollination; adaptations to secure self-pollinated seed.
  - (3) Fertilization.
  - (4) Inflorescence; modes, the arrangement of the buds, the opening of the buds.
  - (5) Microscopic work—cross-section of anthers; cross-section and longitudinal sections of pistils; germinating pollen grains.
- (c) Fruit and Seed:
- (1) Adaptations of seeds and fruits for dissemination.
  - (2) The classification of fruits.
  - (3) The study of seeds of monocotyledons and dicotyledons; their structure; the functions of the parts.
  - (4) Germination—the study of germinating seeds; the growth of the different regions of the embryo; the origin of the parts of the growing plant.
  - (5) Microscopic work:  
Sections of seeds of dicotyledons and monocotyledons.

## II. Cryptogams, Morphology and Life History.

- (a) Algae-Spirogyra, Vaucheria, or any common alga.
- (b) Liverworts-Marchantia.
- (c) Bryophyta—moss.
- (d) Pteridophyta—ferns, horsetail (equisetum).
- (e) Fungi and bacteria—moulds and mildews (mucor), sac fungi, rusts, smuts, mushrooms, polyporus, etc.; any common bacteria.

## III. Phanerogams. Morphology and Special Characteristics.

A practical study of the phanerogams of the district, including the intensive study of at least one representative of one member of each of the following orders: Coniferae, Graminae, Liliaceae, Ranunculaceae, Cruciferae, Rosaceae, Leguminosae, Umbelliferae, Labiateae, Compositae. Emphasis must be laid on the characteristics distinguishing each order.

## IV. Ecology.

- (a) Ecological factors resulting in an environment influencing the morphology of the plant, water, heat, soil, light, wind, changes of season.

- (b) A study of typical plant societies in the district.
- (c) A study of plant societies and the adaptations of the plants in each society to its environment.

## V. General Botany.

- (a) Plant selection.
- (b) Variation.
- (c) Mendel's Laws.

# ZOOLOGY

## I. Arthropoda.

### (a) Insecta:

- (1) Grasshopper. The dissection and study of the grasshopper; a thorough study of the exoskeleton, segmentation, appendages, respiratory organs, sense organs, nervous system, alimentary canal, and excretory system.
- (2) The external features, life history and the adaptations to its environment of a typical example of Coleoptera, Diptera, Hemiptera, Hymenoptera, Odonata, Lepidoptera.

### (b) Spider:

- (1) Life history and habits of a spider. Respiration.
- (2) A study of the external features of the spider.

### (c) Crustacea—crab, lobster.

- (1) Study the external features and the respiration.
- (2) Compare with Albertan forms—Freshwater Shrimp (*Gammarus*), Fairy Shrimp (*Eubrachipus*), *Apus*.
- (d) The general characteristics of Arthropoda based on the comparative study of insects, spiders and crustacea.
- (e) (1) Color adaptations; protective mimicry with examples from the Arthropoda.
- (2) The development of social life among the insects; the effect on the members of the community. Study different species of Hymenoptera as examples.
- (3) Insects and cross-pollination—the adaptations of insects to aid in cross-pollination.

## II. Vermes.

- (a) Earthworm; a study of the external features and mode of locomotion. The dissection of the worm, followed by a study of the respiratory, circulatory, digestive, nervous, excretory and reproductive systems. Study a cross-section.
- (b) Parasitism among worms and its effects on the parasite.

## III. Mollusca.

Clam or Oyster; Snail. The external features and internal structure; locomotion; respiration in the aquatic and in the land forms; the method in which food is secured.



#### IV. Protozoa.

A study of the Amœba and the Paramœcium—the structure of the body; the life functions carried on in the Protozoa. Compare with Infusoria, Foraminifera.

#### V. Chordata.

- (a) Pisces. A study of the external features; locomotion. The internal features—the skeleton, respiratory system and circulatory system; the brain.
- (b) Amphibia; frog, toad, tiger salamander.
  - (1) A study of the external features of amphibia; locomotion.
  - (2) The life history of the frog or toad and of the salamander.
  - (3) A study of the internal features—respiratory, circulatory, digestive and excretory systems; the skeleton; the brain.
  - (4) Adaptations of the skeleton and musculature of the frog and toad for locomotion.
- (c) Reptilia; snake, horned toad.
  - (1) A study of the external features; locomotion.
  - (2) A study of the internal features; respiratory, circulatory, digestive and excretory systems; the skull in snakes.
  - (3) Special adaptations in reptiles for defence and for securing food.
- (d) Aves:
  - (1) A study of the external features; plumage, the kinds of feathers, the eyes, the nostrils, the ears.
  - (2) A study of the internal features; the digestive system, the respiratory system, the circulatory system, the skeleton.
  - (3) Adaptations to flight; in form, in musculature, in the skeleton, in the feathering.
  - (4) Adaptations for an aquatic habitat.
  - (5) Adaptations of the bills and feet.
- (e) Mammalia:
  - (1) The study of the internal features of a mammal; the respiratory, the circulatory, the digestive, the excretory, the nervous system of a mammal; the skeleton; the dentition.
  - (2) Types of dentition.
  - (3) Types of feet; adaptations of feet among mammals.
- (f) Comparative studies of structures among Chordata:
  - (1) Body covering.
  - (2) Circulatory systems and hearts.
  - (3) Central nervous systems.

#### VI. General Zoology.

- (a) Coloration and mimicry.
- (b) Interdependence of species.
- (c) Natural and artificial selection.
- (d) The struggle for existence.

# CHEMISTRY

## Introduction.

Whereas certain of the natural sciences are appearing less frequently on High School courses of study as the years pass, Chemistry is retaining its popularity, along with Physics and Biology. This is due in part to the increased use of Chemistry in modern industry, and to the larger role it is coming to occupy in certain professions, such as medicine, and in certain social enterprises such as public health and sanitation. It is customary to place Chemistry later in the course than Physics, and this principle has been followed in the new course of studies. The aims and purposes of teaching Chemistry are very largely those of any other sciences.

But in Chemistry, more than in some other sciences, it is necessary that the pupil "begin at the beginning." Chemical processes are intelligible only after an analysis of chemical elements. When a few of these are known, it is then possible to pass on to a study of the compounding and dissociation going on in familiar phenomena, *e.g.*, air and water. Only later can the student pass with profit to the larger field of inorganic and organic Chemistry.

The two courses in Chemistry that follow are organized in accordance with the principles stated above. In Chemistry 1, the pupil is introduced to some of the fundamental principles in Chemistry, and should be led to discover the simple laws by experiment on familiar compounds and elements. General Chemistry is to be introduced whenever the teacher finds it advisable, and should not be taught as a distinct body of knowledge. The course is avowedly experimental throughout, and individual or group work should occupy a considerable portion of the time.

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## CHEMISTRY 1

### I. Introductory.

- (a) The field of Chemistry and the importance of the science.
- (b) Physical and chemical change—kinds of chemical change—union and decomposition.
- (c) (1) Kinds of substances—elements and compounds—distinction between mixtures and compounds.  
(2) Elements—occurrences—free and combined—number, distribution and relative importance—classification—metals and non-metals.

### II. An experimental course defined as follows:

- (a) A study of the following elements and their most important compounds—Hydrogen; oxygen; nitrogen; carbon; sulphur; chlorine; potassium; sodium; calcium.
  - (1) Preparation; physical and chemical properties.
  - (2) Occurrence; natural and economic importance.
- (b) Air—composition—importance of each constituent.

- (c) Water :
  - (1) Analysis and synthesis.
  - (2) Inorganic and organic impurities, sources, purification.
  - (3) Water of crystallization—efflorescence, deliquescence, dehydration.
- (d) Solutions—liquid and gaseous—properties—unsaturated, saturated and supersaturated—solubility curve—effect of change in temperature—precipitation, crystallization, filtration.
- (e) Combustion—ordinary, slow, spontaneous, ignition, temperature, flames of candle and Bunsen burners, oxidation and reduction.
- (f) Oxides, acids, bases, salts—properties—neutralization.

### III. General Chemistry.

- (a) Laws—law of conservation of mass—laws of definite and multiple proportions; Boyle's and Charles' Law; law of combining weights; Gay Lussac's Law of Volumes.
- (b) Theories: Atomic and molecular theories; Avogadro's hypothesis; ionization; value of theories in explaining facts and laws and in discovering new truths.
- (c) Valency; formulae, chemical nomenclature, easy equations.
- (d) Atomic, molecular and combining weights—calculations.

The problems listed below are taken from the authorized text. It is expected that the experiments listed at the bottom as suitable for students will actually be performed by them. All others should be demonstrated before the class by the teacher.

1. Experiments on Calcination, Sec. 5.
2. Experiments on Prep. and properties of Oxygen.  
Prep. of Oxides, Metals, Non-Metals.  
Bases, Acids. Sec. 16.
3. Experiments on "Law of Conservation of Weight." Sec. 31.
4. Experiments on Test for Water.
5. Experiments on Action of Metals on Water. Sec. 41.
6. Experiments on Prep. and Properties of Hydrogen.
7. Experiments on Synthesis of Water. Sec. 48.
8. Experiments on Reducing Action of Hydrogen. Sec. 48.
9. Experiments on Solutions. Sec. 57.
10. Experiments on Deliquescence and Efflorescence. Sec. 63-64.
11. Experiments on Prep. and Properties of Hydrogen Chloride.
12. Experiments on Test for Chlorides. Sec. 113.
13. Experiments on Prep. and Properties of Chlorine.
14. Experiments on Reducing Action of Carbon. Sec. 118.
15. Experiments on Prep. and Properties of  $\text{CO}_2$ . Sec. 120-122.
16. Experiments on Test for Carbonates.
17. Experiments on Prep. and Properties of  $\text{CO}$ . Sec. 125-126.
18. Experiments on Prep. and Properties of  $\text{CH}_4$ . Sec. 130.

19. Experiments on Prep. and Properties of  $C_2H_2$ . Sec. 131-132.
20. Experiments with Hard and Soft Water ; Correction of Hard Water. Sec. 139.
21. Experiments on Prep. of Allotropic Forms of S. Sec. 148.
22. Experiments on Activity of S. Sec. 150.
23. Experiments on Prep. and Properties of  $H_2S$ . Sec. 156-159.
24. Experiments on Prep. and Properties of  $SO_2$ . Sec. 160-168.
25. Experiments on Test for Sulphites. Sec. 168.
26. Experiments on Properties of  $H_2SO_4$ . Sec. 171-173.
27. Experiments on Prep. of  $SO_3$ . Sec. 162.
28. Experiments on Test for Sulphates. Sec. 174.
29. Experiments on Prep. of Salts. Sec. 181-182.
30. Experiments on Prep. of  $HNO_3$ . Sec. 187.
31. Experiments on Properties of  $HNO_3$ . Sec. 188.
32. Experiments on Heating of Nitrates. Sec. 189.
33. Experiments on Test for Nitrates. Sec. 190.
34. Experiments on Prep. and Properties of  $N_2O$ . Sec. 192.
35. Experiments on Prep. and Properties of  $NO$ . Sec. 193.
36. Experiments on Prep. and Properties of  $NO_2$ . Sec. 194.
37. Experiments on Prep. and Properties of  $NH_3$ . Sec. 197-198.
38. Experiments Showing Properties of Alkali Metals.
39. Experiments on Flame Tests for Alkali Metals.
40. Experiments on Prep. of  $Br_2$  and  $I_2$  and Activity of each.
41. Experiments on Tests for  $Br_2$  and  $I_2$ .
42. Experiments on Prep. and Properties of  $H_2O_2$ .

Suitable experiments for students: 1, 9, 10, 12, 14, 15, 16, 20, 21, 24, 25, 28, 29, 32, 33, 37, 39, 41.

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## CHEMISTRY 2

### Introduction.

The second course in Chemistry, outlined below, is intended to give a general knowledge of inorganic Chemistry, and of the more important laws and theories relating thereto; to serve as an introduction to organic Chemistry; and to familiarize the student with the methods of qualitative analysis. The major portion of the time will be devoted to the first section of the course. The organic compounds studied are those which are of the most direct significance in daily life. It is expected that the method of treatment will be predominantly experimental, but laboratory work should be supplemented by discussions, some of which should be designed to bring out more fully the economic and industrial aspects of the subject.



## Outline of the Course.

### A. Inorganic Chemistry:

- (1) (a) A study of the following elements and of their most important compounds:  
Hydrogen; helium; lithium; sodium; potassium; copper; silver; gold; calcium; strontium; barium; radium; magnesium; zinc; mercury; boron; aluminium; carbon; silicon; tin; lead; nitrogen; phosphorus; arsenic; antimony; bismuth; chromium; tungsten; oxygen; sulphur; manganese; fluorine; chlorine; bromine; iodine; iron; cobalt; nickel; platinum.
- (b) Their occurrence, mineralogy, and metallurgy.
- (c) Group characteristics—Periodic Law.
- (d) Economic uses of the elements and their compounds and common processes of manufacture.
- (2) (a) Laws of Chemistry—Law of Definite and Multiple Proportions; Boyle's Law; Charles' Law; Gay Lussac's Law of Volume; Dulong and Petit's Law; Raoult's Law; Periodic Law.
- (b) Theories—Avogadro's Hypothesis; Molecular Theory; Atomic Theory; Ionization; Electrons.
- (c) Acids, Bases, Salts,—Neutralization—Normal Solutions.
- (d) Valence; Chemical Formulae; Chemical Equations; Calculations.

### B. Organic Chemistry:

Carbohydrides; Carbohydrates; Alcohols; Acids; Esters; Fats; Soaps; Explosives; Poisonous Gases.

### C. Elementary Qualitative Analysis.

Determination of a number of the more common ions in simple salts, acids, and bases.

*Cations:*  $\text{H}^+$ ,  $\text{Ag}^+$ ,  $\text{Pb}^{++}$ ,  $\text{Cu}^{++}$ ,  $\text{Sn}^{++}$ ,  $\text{Al}^{+++}$ ,  $\text{Zn}^{++}$ ,  $\text{Fe}^{+++}$ ,  $\text{Ca}^{++}$ ,  $\text{Mg}^{++}$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{NH}_4^+$ .

*Anions:*  $\text{Cl}^-$ ,  $\text{S}^{=}$ ,  $\text{SO}_3^{=}$ ,  $\text{PO}_4^{=}$ ,  $\text{CO}_3^{=}$ ,  $\text{NO}_3^-$ ,  $\text{SO}_4^{=}$ ,  $\text{OH}^-$ .

Experiments by students are to be carried out on single salts in solution. Soluble salts may also be given to the student for identification.

### Methods of Analysis.

#### 1. DETERMINATION OF CATIONS:

(a) Test the water solution with litmus. If blue litmus changes to red, indicates  $\text{H}^+$ ; if red litmus changes to blue, indicates  $\text{OH}^-$ . If no change—no  $\text{H}^+$ , no  $\text{OH}^-$ .

(b) To a portion of the original solution add  $\text{HCl}$  as long as a precipitate forms. Filter, save filtrate for (c).

Pour 10c.c. of boiling water repeatedly over the precipitate on the filter paper. Test this liquid with some potassium chromate solution. A yellow precipitate indicates  $\text{Pb}^{++}$ .



If all the precipitate dissolved in hot water  $\text{Ag}^+$  is absent. If not, add ammonium hydroxide to dissolve it and then make the solution, thus obtained, acid with nitric acid (litmus). A white precipitate confirms  $\text{Ag}^+$ .

(c) To a portion of the filtrate from (b) add a few c.c. of a solution of mercuric chloride. A white precipitate turning black confirms the presence of  $\text{Sn}^{++}$ .

Pass  $\text{H}_2\text{S}$  into the balance of the filtrate after diluting to 100c.c. If no precipitate  $\text{Pb}^+$ ,  $\text{Cu}^{++}$ ,  $\text{Sn}^{++}$  are absent. If there is a precipitate, filter, reserve this filtrate for (d).

Treat the precipitate with Nitric Acid. Disregard anything which is not dissolved. Filter if necessary. To the nitric acid solution add 2-3c.c. dilute sulphuric acid. A white precipitate is due to  $\text{Pb}^{++}$ . Filter, make alkaline with ammonium hydroxide. A deep blue color confirms  $\text{Cu}^{++}$ .

(d) Make the solution or filtrate from (c) alkaline with ammonium hydroxide and saturate with hydrogen sulfide.

A precipitate indicates  $\text{Al}^{+++}$ ,  $\text{Zn}^{++}$  or  $\text{Fe}^{+++}$ . Filter, reserve the filtrate for (e). Dissolve the precipitate in dilute  $\text{HCl}$ . Make alkaline with  $\text{NaOH}$ . Add a little  $\text{Na}_2\text{O}_2$  — boil. A red precipitate indicates  $\text{Fe}^{+++}$ . Filter. Make the filtrate acid with  $\text{HNO}_3$ , then alkaline with  $\text{NH}_4\text{OH}$ . A white precipitate indicates  $\text{Al}^{+++}$ . Filter. Pass  $\text{H}_2\text{S}$  into filtrate. A white precipitate confirms  $\text{Zn}^{++}$ .

(e) Make the filtrate from (d) acid with  $\text{HCl}$ . Boil until all  $\text{H}_2\text{S}$  is expelled. Make alkaline with  $\text{NH}_4\text{OH}$ . Add ammonium oxalate solution. A white precipitate confirms  $\text{Ca}^{++}$ . Test for completeness of precipitation. Filter.

(f) Make a portion of the filtrate ( $\frac{1}{4}$ ) alkaline with  $\text{NH}_4\text{OH}$ . Add sodium phosphate solution, and allow to stand. A white precipitate confirms  $\text{Mg}^{++}$ . Evaporate the remainder of the solution to about 10c.c. Test a portion of the solution in the flame of a platinum wire. A persistent yellow coloration to the flame indicates  $\text{Na}^+$ . A violet coloration visible through cobalt glass confirms  $\text{K}^+$ .

(g) Make a portion of the original solution alkaline with sodium hydroxide. The odor of ammonia confirms  $\text{NH}_4^+$ .

## 2. DETERMINATION OF ANIONS:

Carry out individual tests on portions of the original substance.

*Test for  $\text{Cl}^-$ .* Make some of the original solution acid with  $\text{HNO}_3$ . Add a few drops of  $\text{AgNO}_3$  solution. A white precipitate confirms  $\text{Cl}^-$ .

*Test for  $\text{S}^{=}$ .* Make portion of original acid. A piece of filter paper moistened with  $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$  held above the vessel will turn black if  $\text{S}^{=}$  present. Solution will smell of  $\text{H}_2\text{S}$  if  $\text{S}^{=}$  present.

*Test for  $\text{SO}_3^{=}$ .* The acidified solution smells of  $\text{SO}_2$  if  $\text{SO}_3^{=}$  is present.

*Test for  $\text{CO}_3^{=}$ .* Acidify some of the solution with  $\text{HNO}_3$ . Pass the gas evolved into clear lime water. A white ppt. confirms  $\text{CO}_3^{=}$ .

*Test for  $\text{PO}_4^{=}$ .* Acidify a portion of the original solution with  $\text{HNO}_3$ . Add about a gm. of solid  $\text{NH}_4\text{NO}_3$ . Add  $(\text{NH}_4)_2\text{MoO}_4$  solution. Warm a little. A yellow precipitate confirms  $\text{PO}_4^{=}$ .

*Test for  $\text{NO}_3^-$ .* Acidify a portion of the original solution in a test tube with  $\text{H}_2\text{SO}_4$ . Add  $\text{FeSO}_4$  solution. Carefully pour in conc.  $\text{H}_2\text{SO}_4$  so that it forms a layer below the remainder of the solution in the tube. A brown ring between the two layers confirms  $\text{NO}_3^-$ .

*Test for  $\text{SO}_4^{--}$ .* Acidify a portion of the solution with  $\text{HNO}_3$ . Add  $\text{Ba}(\text{NO}_3)_2$  solution. A white precipitate confirms  $\text{SO}_4^{--}$ .

## Experimental Work.

Below will be found a list of problems taken from a manual entitled *Exercises in Chemistry*, by McPherson and Henderson. This manual should be in the hands of every teacher of Chemistry 2. It may be had from the School Book Branch. Where any of the experiments listed were carried out as a part of the Chemistry 1 course, all such may be omitted from this year's work. It is expected that those listed at the bottom as suitable for students will be actually performed by them. All others will be demonstrated before the class by the teacher. Problems have been arranged in the order in which the material occurs in the authorized text.

### Exercise

No.	PURPOSE OF EXPERIMENT	Page
1.	Measurement of Volumes .....	1
2.	Determination of Weights .....	2
3.	Manipulation of glass tubing, sec. <i>b</i> and <i>c</i> .....	5
12.	Measurement of gas volumes .....	22
20.	States of Matter, sec. <i>a</i> , <i>b</i> , <i>c</i> , <i>d</i> , and <i>f</i> .....	35
7.	Oxygen .....	13
13.	Some Quantitative Relations of Oxygen .....	23
9.	Hydrogen, sec. <i>a</i> (opt.), sec. <i>b</i> , <i>c</i> and <i>d</i> .....	17
27.	Solutions .....	46
62.	Colloidal Solutions (opt.) .....	86
28.	Solubility of certain solids in water (opt.) .....	47
50.	Hydrates, sec. <i>a</i> , <i>b</i> , sec. <i>c</i> (opt.) .....	74
16.	Hydrogen Peroxide, sec. <i>a</i> , <i>b</i> , and <i>c</i> , sec. <i>d</i> (opt.) .....	28
30.	Hydrogen Chloride and Hydrochloric Acid, sec. <i>c</i> .....	51
52.	Reactions of Chlorides .....	76
15.	The Composition of Water .....	26
19.	Determination of Formulas .....	33
70.	Compounds of Metals .....	96
31.	Sodium: Sodium Hydroxide, sec. <i>a</i> (opt.), sec. <i>b</i> .....	52
71.	Compounds of Sodium, sec. <i>c</i> , <i>e</i> , and <i>f</i> .....	97
73.	Potassium, sec. <i>a</i> , sec. <i>b</i> (opt.) .....	99
24.	Valence, sec. <i>a</i> and <i>b</i> .....	40
32.	Acids, Bases and Salts .....	53
33.	Ratio of Acid to Base in Neutralization .....	54
41.	Equilibrium in Solution .....	64
37.	Aqua Ammonia (opt.) .....	60
74.	Ammonium Compounds .....	100

## Exercise

No.

## PURPOSE OF EXPERIMENT

Page

40. Oxides of Nitrogen .....	63
38. Nitric Acid, sec. <i>b</i> , <i>c</i> , and <i>d</i> .....	61
39. Nitrates .....	62
43. Carbonic Acid and its Salts.....	67
45. Hydrogen Sulphide .....	69
46. Sulphides .....	70
47. Sulphites, sec. <i>d</i> .....	71
48. Sulphuric Acid, sec. <i>b</i> and <i>c</i> .....	72
49. Sulphates .....	73
85. Copper, sec. <i>a</i> , <i>c</i> , <i>d</i> , <i>e</i> , and <i>g</i> .....	110
87. Silver, sec. <i>c</i> and <i>e</i> .....	113
35. Electro-chemical Series .....	58
77. Compounds of Calcium, sec. <i>b</i> and <i>e</i> .....	102
82. Water-softening and Purification, sec. <i>a</i> , <i>b</i> , <i>c</i> , sec. <i>d</i> (opt.) .....	107
79. Magnesium and its Compounds.....	104
80. Zinc, sec. <i>b</i> .....	105
86. Mercury, sec. <i>a</i> , <i>b</i> and <i>d</i> .....	112
81. Aluminium, sec. <i>a</i> , <i>c</i> , and <i>d</i> .....	105
88. Tin, sec. <i>b</i> .....	114
89. Lead, sec. <i>b</i> .....	114
90. Tests for Silver, Lead, and Mercury (opt.).....	115
56. Compounds of Phosphorus, sec. <i>b</i> and <i>c</i> .....	81
58. Antimony, sec. <i>b</i> .....	84
59. Bismuth, sec. <i>b</i> and <i>c</i> .....	84
51. Hydrogen Fluoride (opt.).....	75
53. Bromine and Hydrogen Bromide, sec. <i>b</i> , <i>c</i> , <i>d</i> , <i>e</i> , and <i>f</i> .....	77
54. Iodine and Hydrogen Iodide, sec. <i>b</i> , <i>c</i> , <i>d</i> , <i>e</i> , and <i>f</i> .....	78
55. Chlorides, Bromides, and Iodides (opt.).....	80
83. Iron, sec. <i>a</i> , <i>c</i> , and <i>e</i> .....	108
84. Detection of Certain Metals (opt.).....	109

The following exercises are suitable for individual work by students. A minimum should be attempted and as many more as time will permit.

Exercises 1, 2, 3 *b* and *c*, 12, 20, 7, 27, 28, 50 *a* and *b*, 52, (19*a* if 15 is demonstrated), 70, 31*b*, 71*c*, *e* and *f*, 32, 74*a*, 40, 38*b*, *c* and *d*, 39, 43, 47*d*, 48*b* and *c*, 49, 85*c*, *d*, *e* and *g*, 87*c* and *e*, 35, 77*b* and *e*, 82*a*, *b* and *c*, 80*b*, 86*a*, *b* and *d*, 88*b*, 89*b*, and 54.

# GENERAL SCIENCE 1

## Introduction.

The courses in Natural Science, as commonly outlined for secondary schools, have been organized with a view to presenting in logical sequence the data and principles of limited and exclusive fields of natural phenomena. They are consequently designed for specialization and intensive study. General Science, on the other hand, aims at a broad acquaintance with the field of natural phenomena regarded as a related whole, and hence serves as a suitable introduction to the more specialized courses to be taken later. The materials selected for the General Science course are, moreover, those which are considered of most direct value for the student who may be able to spend only one year in High School. The course requires a number of simple experiments to be performed in the laboratory, and of projects which may be conducted at home or in the vicinity of the school. It may be supplemented by projects not suggested in the outline, but which are very closely related to the student's interests or the school's environment.

## Outline of Course.

General divisions:

- (1) Measurement.
- (2) Air.
- (3) Water.
- (4) Life.
- (5) Energy.
- (6) The earth's crust.
- (7) Solar system.

## I. Measurement.

- (a) Importance. Everyday applications.
- (b) Science and Engineering's debt to Measurement.
- (c) Units, Fundamental, Derived, Variable and Precise.
- (d) Standards. Measuring Instruments. The Vernier.
- (e) Suitable exercises in actual measurement.

## II. Air.

- (a) (1) Physical characteristics: weight, pressure, expansibility and compressibility.
- (2) Applications of physical characteristics: football, pneumatic tire, air gun, air pump, lift pump, siphon, vacuum cleaner, windmill, balloon, air-ship.
- (b) Pressure of the atmosphere.
  - (1) Barometer—measurement of air pressure.
  - (2) Heating and cooling of the atmosphere—effect on atmospheric pressure.

- (3) Movements of atmosphere due to changes in pressure—storms, cyclones, trade winds, etc.
- (4) Variation of pressure of atmosphere with elevation.
- (c) Composition of the air.
  - (1) Experimental determination of the following constituents: oxygen, nitrogen, carbon, dioxide, water vapor and dust.
  - (2) Natural importance of each constituent of the air:
    - (a) Oxygen:
      - (i) Combustion:
        - (a) Flame of a candle.
        - (b) Slow combustion—rust of iron.
        - (c) Decay of plant or animal matter.
      - (ii) Oxygen in relation to plants.
        - (a) Germination of seeds.
        - (b) Plant respiration.
        - (c) Root development stimulated by aeration and sweetening of soil.
      - (iii) Oxygen in relation to animals.
        - (a) Respiration—adaptations for respiration: gills of fish and oysters, air tubes of insects, lungs and air spaces of frog, bird and man.
      - (iv) Inhaled and exhaled air—differences in carbon dioxide and moisture content.
      - (v) Ventilation—Purposes—Methods of ventilating houses, schools, stables and mines.
      - (vi) Combustion in animal body as a source of heat or other form of energy.
    - (b) Nitrogen:
 Importance as plant food—method of fixing nitrogen in soil. The nitrogen cycle.
    - (c) Carbon dioxide:
      - (i) Methods of production:
        - (a) Respiration of animals.
        - (b) Combustion.
        - (c) Decay of plants and animals.
        - (d) Germination of seeds.
      - (ii) Importance to plants—used as plant food by green leaves and stems—photosynthesis.
    - (d) Water Vapor:
      - (i) Relative humidity—Its relation to rate of evaporation of water and sublimation of ice and snow.



- (ii) Relative humidity in relation to health.
- (iii) Formation of dew, mist, rain, hail, snow and frost.

### III. Water.

#### (a) Properties :

- (1) Forms, weight, pressure, transmission of pressure buoyancy, solvent power, osmosis, surface tension capillarity.
- (2) Applications : water power, water system, force pump, hydraulic press, specific gravity, air in solution, alkaline, mineral and hard waters, the effect of washing soda on hard water.

#### (b) Composition of water—analysis and synthesis of water.

#### (c) Relation of water to plants.

- (1) Absorption of water and materials in solution by roots—importance of rootlets and root hairs in increasing the absorptive surface.
- (2) Conveyance of water through root, stem and leaf.
- (3) Osmotic action.
- (4) Evaporation from leaves—adaptations to prevent excessive evaporation.
- (5) Constituent of plant tissues—formation of water in drying or burning plants.
- (6) Relation of plant and animal life.

#### (d) Drinking Water.

- (1) Sources of drinking water.
- (2) Sources of contamination.
- (3) Natural methods of purification.
- (4) Filtration and the construction of filters.

#### (e) Water in relation to industry and commerce.

- (1) Water powers—importance as sources of energy.
- (2) Irrigation.
- (3) Transportation.

### IV. Life.

#### A. The Life Cycle.

Air		Air
Water	Energy-Plants-Animals-Energy	Water
Soil		Soil

#### B. Plants.

##### (1) Adaptations :

- (a) To secure plant food from air and soil.
- (b) To meet climatic conditions and changes in seasons.
- (c) For protection against animals.

- (2) Processes by which plant food is transformed into plant tissues and reserve food.
- (3) Production and dissemination of seeds.
- (4) Plant distribution.

Treat in a general way, from observed facts rather than by notes, the great controlling factors in plant distribution, viz.:

- (1) That plants are almost universally distributed over land and water areas.
- (2) That aquatic plants have very special adaptations of roots, stems, and leaves which enable them to live in the water.
- (3) That some aquatic plants are rooted to the bed of the sea or lake or other body of water whilst others are not.
- (4) That since sunlight is absolutely necessary to the manufacture of plant food, the great problem of water-inhabiting plants is to hold their leaves at, or very near, the surface, hence the adaptations to secure floating of the leaves, *e.g.*, bladder-like cells filled with air, large leaves, etc.
- (5) The vegetation of land areas is characterized by groups or associations of plants that are determined by the conditions of moisture, heat, soil, light, and wind.
- (6) Show in a simple way how these conditions produce the forest, jungle, swamp, marsh, grassy plain, tundra, and desert types of vegetation.
- (7) Study the vegetation zones around a slough or stream near the school.

### C. Animals.

The object here is to show how animals are differently adapted to secure their food, to move about and to protect themselves from their enemies. It is not to teach formal zoology.

#### *Adaptations for Securing Food.*

##### (1) Plant Food:

- (a) *Insects* living on plant food either bite the leaf or the underground stem or else bore through the bark and suck the sap.

Examples: Grasshoppers—Leaf eaters.

Aphids —Sap drinkers.

Cutworms —Eat underground stems.

Point out damage done by these animals.

- (b) *Birds*—The seed-eating birds; point out the characteristic stout, wedge-shaped, pointed beak of such birds, *e.g.*, sparrows, grosbeaks, etc.
- (c) *Herbivorous Mammals*—Adaptations, sharp chisel-like front teeth, absence of fangs, special structure of grinding teeth. *E.g.*, the rabbit, horse, sheep, beaver. Some have no cutting teeth in upper jaw, *e.g.*, cattle.

Note also the special adaptations of the long curved constantly growing front cutting teeth of the gnawing animals and the hand-like nature of their front paws, *e.g.*, squirrel, beaver, etc.

## (2) Animal Food :

- (a) *Insects*.—The Ladybug feeds upon Aphids. The Ichneumon-fly lays its eggs in or on the bodies of caterpillars, and the young larvæ feed on the tissues of their host.

Point out the usefulness of these two insects to man in preventing undue increase of harmful insects.

- (b) *Fishes*.—Inward curving sharp spine-like teeth.  
(c) *Frogs*.—Special adaptation of tongue for catching insects.  
(d) *Snakes*.—Wide gape, elastic hinge to jaw, inward curving teeth.  
(e) *Carnivorous Birds*.—Sharp, strong curved beak for tearing, hooked and strong claws for grasping.  
(f) *Carnivorous Mammals*.—Special teeth structure, fangs, sharp hooked claws for grasping or strong blunt claws for digging out burrowing animals.

## *Adaptations for Locomotion.*

### (1) Aquatic :

- (a) *Fish*.—Tail for propulsion, fins for balancing.  
(b) *Salamander*.—Flattened, sometimes fringed, tail for propulsion; feet used for balancing.  
(c) *Frog*.—Hind legs large and muscular, with webbed feet for propulsion; front legs for balance.  
(d) *Duck*.—Webbed strong feet set far back on body, oily feathers.

### (2) Terrestrial :

- (a) *Grasshopper*.—3 pairs jointed legs for walking, special foot adaptations for climbing; very powerful, large, hind legs for jumping.  
(b) *Snake*.—Scutes on under side of body, attached to ribs, and muscular contraction and expansion of body.  
(c) *Rabbit*.—Powerful hind legs.  
(d) *Horse*.—Walks on nail of great toe; knee and hock really the wrist and ankle joint; powerful muscular development.

### (3) Aerial :

- (a) *Butterfly*.—Gauzy or scaly-covered wings.  
(b) *Pigeon*.—Digits of front limbs lost, uses whole arm covered with and enlarged by special arrangement of feathers; powerful breast muscles and keeled breast-bone.

- (c) *Bats*.—The only really flying mammal; uses an umbrella-like covering of thin skin stretched over the fingers of the hand and reaching to the body, hence the scientific name for the bat means “hand-winged.”

#### *Adaptations for Protection:*

Four methods of protection are used by animals.

(1) Protective covering:

- (a) *Chitin*, a horny substance covering the bodies of some insects, *e.g.*, the grasshopper, the wing cases of beetles.
- (b) *Scales*, of fishes and snakes.
- (c) *Shells*, of oysters, snails, etc.
- (d) *Feathers*, of birds.
- (e) *Fur*, of mammals.
- (f) *Blubber or fatty coating of aquatic mammals*, like whales, seals, etc.

(2) Protective Coloration.—This takes several forms, sometimes harmonizing with their surroundings, *e.g.*, white of Polar bears, Arctic foxes, ruffed grouse, etc.

- (a) *Seasonal Change*, *e.g.*, the Arctic hare (rabbit), the ptarmigan, the weasel, etc.
- (b) *Mimicry*: the animal is colored to imitate some other animal which may sting, or have a nauseating taste, etc.

(3) For Attack.—Fangs of carnivores, retractile claws, horns, stings, discharge of offensive fluid, kicking, etc.

(4) Habits.—Building of nests, digging burrows, muskrat and beaver houses, etc.

#### **D. Man's Control of Plants and Animals.**

- (1) Shown in farming, ranching, etc., producing heavier yields than in wild state.
- (2) Man originates new varieties of plants and animals by selection and hybridization.
- (3) Stories of the work of Luther Burbank, Dr. Andrews, and others in the production of new varieties of plants.
- (4) Point out the new breeds of fowls, hogs, etc., that are constantly being evolved and show how these principles are made use of to produce special types of animals adapted for definite purposes, *e.g.*, the lard hog, the wool sheep, and the mutton sheep, etc.

Always bear in mind that Agriculture is not being taught, but simply the scientific ideas underlying it.

#### **V. Energy.**

- (a) Nature of energy—relation to matter.

- (1) Manifestations—kinetic, potential, heat, electrical, radiant, vital.
  - (2) Transformation.
- (b) Energy in relation to man.
- (1) Generation :
    - (a) Mechanical—windmills, water powers and water wheels.
    - (b) Chemical—combustion in furnaces, steam engines, internal combustion engines.
    - (c) Electrical—dynamo—Use in electric lights, electric irons, motors, magnets.
  - (2) Machines to utilize energy :  
 Levers, pulleys, inclined plane, wheel and axle—common examples of these machines—mechanical advantage.
- (c) Sun as the source of energy used on the earth.
- (1) Utilization of sun's energy by plants.
  - (2) Energy stored in fuels and foods.
  - (3) Energy of the sun available by running water.

## VI. The Earth's Crust.

- (a) Elevations and depressions of the earth's crust.
- (b) Types of rock—stratified, igneous, metamorphic formation.
- (c) Mineral deposits—origin and mode of occurrence, *e.g.*, coal, oil, gas, salt, iron, copper.
- (d) Soils :
  - (1) Origin—rock disintegration—agencies, weathering, frost, surface and underground streams, waves, winds, plants, etc.
  - (2) Transporting and depositing of sediments.
- (e) Projects—Study of the physical features, rocks, mineral deposits, etc., of the vicinity.

## VII. Solar System.

- (a) *Sun and Stars* :
  - (1) Sun :
    - (a) Centre around which the planets revolve.
    - (b) Source of light and energy of the planets and satellites.
    - (c) Magnitude—Comparison of its diameter with that of the earth.
  - (2) Stars :
    - (a) Centres of other solar systems.



- (b) Constellations—Recognition of the North Star and a few of the best known constellations, *e.g.*, Orion, Pleiades, Pegasus, Northern Crown.
  - (b) Planets:
    - (1) The Earth:
      - (a) The earth's orbit and time required to complete the circuit of its orbit.
      - (b) The seasons—relation of seasons to the inclination of the earth's axis to the plane of its orbit.
      - (c) Diurnal rotation—length of day and night—meridians—standard time.
    - (2) Other planets:
      - (a) Recognition of Venus, Jupiter, Mars.
      - (b) Comparison of the magnitudes of their orbits.
  - (c) Satellites:
    - (1) The earth's satellite—Moon.
      - (a) Its orbit—Time required to complete circuit of its orbit.
      - (b) Phases of the moon.
      - (c) Eclipses of sun and moon.
      - (d) Tides.
    - (2) Relation of satellites generally to planets.
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## GEOGRAPHY 1

In the course in Geography in this grade it is proposed to devote the major portion of the time to Industrial and Commercial Geography, and a minor portion to the study of weather and climate. The latter features will be studied first in order that the relation of climate to human activities may be clearly shown. The course in Industrial and Commercial Geography will treat of man's activities as influenced by the earth, rather than with the parts of the earth as they affect human activities.

### Weather.

- (a) Organization of Dominion Meteorological Service, with special reference to the work of the stations in Alberta, and the distribution of the charts from the central station (Toronto).
- (b) Principal observations made at a meteorological station, *e.g.*, pressure, temperature, moisture, wind.
- (c) Principles of instruments used—
  - (1) Self-registering barometer.

- (2) Thermometer and thermometer shelter.
- (3) Hygrometer (wet and dry bulb).
- (4) Rain-gauge.
- (5) Anemometer.

Practice in use of simple forms of some of the instruments in school.

- (d) Use of observations in preparation of weather charts at central office. Charting of pressure observations of different stations in order to determine areas of high and low pressure. Cyclones; sequence of wind and weather in a cyclone; production of rainfall in a cyclone; anticyclone.
- (e) Interpretation of weather maps and principles forecasting:
  - (1) Weather types.
  - (2) Secondary depressions.
  - (3) V-shaped depressions.
  - (4) Wedge isobars.
  - (5) Straight isobars.

## **Climate.**

- (a) Definition of climate.
- (b) Factors determining climate:
  - (1) Latitude.
  - (2) Altitude above sea level.
  - (3) Relative distribution of land and water.
  - (4) Mountain range.
  - (5) Topography of locality.
- (c) Division of earth into climate zones based upon:
  - (1) Latitude.
  - (2) Temperature.
  - (3) Wind system.

Subdivisions of zones upon basis of surface of topography. Position, limit and chief characteristics of the climatic regions based upon wind, *i.e.*—

- (1) Tropical regions (equatorial and north and south trade-wind belts).
- (2) Sub-tropical regions (northern and southern high pressure belts.)
- (3) Monsoon region of south-eastern and eastern Asia.
- (4) Temperate regions (north and south-west wind belts).
- (5) Circumpolar regions.

(d) Influence of climate upon human activities :

- (1) Limitation of man's movements by climatic barriers, such as fogs, winds, and icebergs on ocean, low temperature, wind, etc., in mountains, lack of rainfall, sand-storms, and sand dunes in deserts, damp heat of tropical forests, temperature and fields of snow and ice in polar regions.
- (2) Relation of climate to nature of human food, clothing, and shelter.
- (3) Relation of climate to human health and energy.

### **Relation of Natural Barriers to Social Development of Races.**

- (a) Lack of natural barriers produces a nomadic people, *e.g.*, Arabs.
- (b) Isolation by deserts, *e.g.*, Ancient Egyptians.
- (c) Isolation by seas, *e.g.*, British.
- (d) Isolation by mountains, *e.g.*, Swiss.
- (e) Isolation by mountains and seas, *e.g.*, Ancient Greeks.
- (f) Isolation by mountains and deserts, *e.g.*, Chinese.
- (g) Relation of environment to development of racial characteristics.

## **INDUSTRIAL AND COMMERCIAL GEOGRAPHY**

### **Introduction.**

Conditions affecting production, distribution, and exchange of commodities :

- (1) Climate (as above).
- (2) Soils.
- (3) Human elements (race, government, etc.).
- (4) Physical features.
- (5) Transport.
- (6) Influences determining position of commercial and industrial centres.

### **I. Industrial Geography :**

Instead of following the regional method of treatment adopted in the Public School course, it is proposed to deal with the different industries, thus avoiding much repetition. For example, wheat-growing is carried on in every continent except Antarctica, and proceeds from certain conditions of environment. Its treatment as a unit brings causes and results together in their explanatory relation, and makes the facts not only appeal to the reason but also grip the memory. This method of treatment of world industries, when properly illustrated by charts and diagrams, should give a

sound knowledge of the activities of each country without sacrificing the no less valuable knowledge of the industries themselves. Special stress is to be laid upon the resources of Canada and the British Empire along each line as well as with competitors with whom we have to contend.

## II. Agriculture:

### (a) The Cereals.

#### (1) Wheat.

Soil and climatic requirements of the plant. Extension of wheat-growing areas by (i) development of new varieties adapted to particular purposes and environments. (ii) Invention of gradual reduction process of milling spring-sown wheat. (iii) Improvement of transportation facilities. The important wheat-producing and wheat-exporting countries. Comparison of yield in various areas and the principal causes of the low average yield in the great wheat-exporting countries, such as limited rainfall, lack of modern methods of cultivation, insect pests and fungus disease. Factors influencing cheap production of wheat in various countries, such as cheapness of land (Canada, Argentina), cheapness of labor (India). Comparison of position of wheat-exporting regions with respect to cost of transportation to world markets. Future wheat supply. Flour-milling location of chief centres and factors contributing to their development, disposition of by-products.

#### (2) Oats, barley, corn, rice, buckwheat, rye; briefer treatment than in (1).

### (b) Starch foods.

Potato, banana, sweet potato.

### (c) Legumes.

Peas, beans, clovers, etc.

### (d) Vegetables, fruit and wine industries.

Vegetable and garden products. Apple-growing. Peach belts of America and Europe. Canning of fruit and vegetables. Dried fruits, prunes, raisins, figs, dates, currants, etc. Citrons and other tropical and sub-tropical fruit. Grapes and the manufacture of wine.

### (e) Sugar and sugar refining.

The sugar beet climatic requirements, harvesting, distribution of sugar beet-growing. The growing of the sugar cane and the production and exportation of raw sugar. World's sugar consumption. Refining of sugar, and the by-products of sugar-making. Manufacture of glucose and corn syrup. The maple syrup industry.

### (f) Cotton.

Universal use of cotton. Climatic and soil requirements of the cotton plant. Important cotton-growing areas. Insect pests.

(g) Flax, jute, hemp and other fibres.

Flax and its preparation. Cultivation for fibre and for seed jute—its cultivation and uses. The minor fibres.

(h) Rubber.

Production of "wild" rubber in the Amazon and Congo River Basins. Increase in rubber consumption with development of the automobile. The story of "plantation" rubber. "Synthetic" rubber. Rubber manufacturers.

(i) Tobacco.

Wide range of cultivation. Tobacco an intensive crop. World production. Tobacco-manufacturing.

(j) Tea, coffee, cocoa, spices.

Tea-factors affecting distribution of tea culture, tea industry of Ceylon, India, China and Japan; Mate or Paraguay tea. Growth and preparation of coffee. Coffee-growing regions of the world. Exacting climatic conditions for growing of cocoa tree. The producing areas. Preparation of cocoa and chocolate.

Production of spices largely limited to the tropics. Growing of ginger, cinnamon, nutmegs, cloves, vanilla, mustard, pimento.

(k) Vegetable oils and nuts.

Olives and olive oil, palm oil industry of Africa. Cocoanuts, coconut oil, and copra. Linseed, cottonseed, rapeseed, and sesame-seed production. Essential oils, gums, and resins. Almonds, walnuts, and other nuts.

(l) Animal industries.

Meat and meat supply. Relation of meat animals to density of population and to production of hay. Cattle distribution, effect of modern methods of shipping and preserving meat upon beef cattle.

Production, dairying industry, production and transportation of dairy products, dairy substitutes.

Swine—distribution of hogs, relation of industry to grain-growing and forests. Sheep—wool and mutton production and their relation to refrigeration. Goats—an animal of semi-arid regions; production of mohair. Draft animals—horse, mule, donkey, ox, dog, yak, llama, reindeer, camel, elephant. Poultry and small animal industries; poultry-keeping an almost universal form of animal industry, a by-product in extensive agriculture or main product in intensive agriculture. Ostrich-farming, bee-keeping, rearing of song birds, raising of rabbits.

### III. Fisheries:

(a) Ocean fisheries: Relation of spawning and food habits to location of fishing grounds. The three important fishing regions, their products, and methods of fishing.



- (b) Shore and river fisheries: salmon, sturgeon, oyster, lobster, clam, sponge, pearl.
- (c) Inland fisheries.
- (d) Fish canneries.
- (e) Sealing and whaling.

#### **IV. Manufacturing Industries:**

- (a) Fundamentals of manufacture:
  - (1) Raw materials.
  - (2) Labor: Relation between supply of labor for manufacturing and new land and new resources.
  - (3) Capital.
  - (4) Power.
    - (a) Coal—Coal fields of the world and their relation to manufacturing; production of coke, gas, and gas by-products.
    - (b) Water power—Resources of the world, exploited and unexploited; development of hydro-electric power.
    - (c) Petroleum—Distribution of the great oil fields of the world; world-wide search for new sources of oil; transportation of crude petroleum; petroleum refining; petroleum products and their uses; natural gas; bituminous sand.
    - (d) Other possible sources of power—tides, industrial alcohol, etc.
  - (5) Transportation.

#### **V. Iron and Steel Industry:**

Importance of iron. Outline of manufacturing process. Distribution of industry.

#### **VI. Forest Industries and Paper:**

Location of centres of lumbering industry and nature of their products. Products of the tropical forest. World production of pulp and paper. Scientific forestry and forest conservation.

#### **VII. Textiles and Clothing:**

Wool, cotton, linen, silk (natural and artificial). World centres of manufacture and the chief factors contributing to the location of the industries.

Manufacture of clothing. A city industry. Rapid increase in the use of factory-made clothing throughout the civilized world.

#### **VIII. Leather and Leather Products:**

Sources of hides and skins; tanning materials—quebracho extract, bark of oak, hemlock, wattle and other trees, chromium com-

pounds. Leather-manufacturing nations. Modern shoe-manufacturing. Glove-making. Harness and saddles.

## **IX. Machinery, Ship-building, and Metal Industries:**

Manufacture of (1) machine tools, (2) agricultural machinery, (3) automobiles, (4) electrical machinery, (5) carriages and wagons, (6) locomotives, (7) railway cars, (8) hardware and small metal goods. Raw materials for ship-building. Concentration of ship-building in a few centres and the factors that have promoted the growth of these centres.

## **X. Chemical Industries:**

Manufacture of sulphuric acid, "basic chemical." Manufacture of soda, calcium carbide, carborundum, nitric acid, and the manufacture of explosives. The fertilizer industry—phosphates, potash, natural and manufactured nitrates. Soap-making industry. Coal tar, drug and dye stuff industry.

## **XI. Mineral Industries:**

- (a) Building materials: brick, cement, building stone, marble, and road-making materials.
- (b) Pottery and porcelain manufacture in Europe, America, China, Japan, etc.
- (c) Manufacture of glass.
- (d) Copper: Location of ores and smelting and refining centres. Nickel industry of Ontario. Manufacture of aluminium. World's gold mining areas. Silver deposits of the world. Diamond industry. Asbestos and its uses. Production of lead, zinc and tin, and minor metals.

# **COMMERCIAL GEOGRAPHY**

## **I. Trade Routes of North America:**

Domination of Great Lakes in determination of routes. The Great Lakes and St. Lawrence Waterways route. Canal system of America. Mississippi River traffic. Transcontinental railways of Canada and United States. Hudson Bay route. Routes of Mexico. Relation of Panama Canal to trade routes of North America.

## **II. Trade Routes of Europe:**

Natural advantages of Europe for commerce. The two heavy traffic water routes. Importance of the canal and river transport system of the continent. Fast railway traffic on overland routes. Trade routes of Russia.

## **III. Trade Routes of Asia:**

Geographic handicap to transportation. Importance of rivers. Caravan routes. Trans-Siberian Railway, Trans-Caspian Rail-

ways, Bagdad Railway. Trade routes of India and China. Transportation in Japan.

#### **IV. Trade Routes of Africa:**

Regular coast line with few good harbors. Climatic conditions and rapid flow of rivers an obstacle to trade. "Cape to Cairo Railway" and its feeders. Congo River route. Caravan routes now of little importance.

#### **V. South American Trade Routes:**

Geographic barriers to commerce. Traffic of the great rivers. The Trans-Andean Railway. Concentration of railways in Brazil in coffee-producing area. Railway expansion in Argentina. Commercial isolation of Pacific South America.

#### **VI. Trade Routes of Australasia:**

Arid and semi-arid interior of Australia and its effect on commerce. Transportation in New Zealand. Trade connection of Australia and New Zealand with rest of world.

#### **VII. Ocean Transportation:**

- (a) Types of ocean service. (Liners and tramps.)
- (b) "The Great Circle Line."

#### **VIII. North Atlantic Trade Routes:**

- (a) Great circle routes.
- (b) Obstacles to navigation.
- (c) A "trunk" route.
- (d) Fuel supply.
- (e) Nature of traffic.

#### **IX. Mediterranean-Asiatic Routes** (treated in VIII).

#### **X. North Pacific Route.**

#### **XI. Cape of Good Hope Route.**

#### **XII. Panama Canal** and its effect upon the world of commerce.

# PHYSICS 1

## Introduction.

The first course in Physics, outlined below, aims to secure that the student shall obtain a knowledge of the most important principles of the science, and shall be led to realize that these laws are operative in the most familiar facts of his own environment. The rapid expansion of vocabulary, incident to progress in the science, is attended with some dangers, and it is equally important that the student shall understand clearly the meanings of all the terms that he is called upon to use. Faulty or inadequate concepts, and consequently incorrect or careless thinking, must be prevented at all costs, even at the reduction of the body of material here indicated.

The course which follows proposes to secure these ends by directing the attention of the student to well known physical phenomena, and by leading him to interpret his findings in terms of general principles or laws. All such principles should be fully illustrated, either by class, group, or individual experimentation. The student should from the outset use the technical language of the science in a precise way, and the use of the terms should be frequently checked. Laboratory reports should be prepared by each individual pupil.

At no point in the school course is it more necessary to correlate the work of the various subjects than in the teaching of Physics. Pupils who are passably good in Arithmetic, Algebra, Geometry, and theoretical Physics fail utterly when they are required to use Mathematics in the solution of physical problems. Accurate training in the method of scientific thinking, *i.e.*, in isolation of the known facts, in determination of the end to be achieved, in a decision as to the method to be employed, and in checking the results obtained is secured only by frequent and accurate repetition. This method must be followed step by step in the early stages, but the teacher will be amply repaid for his efforts.

Abundant use should be made of illustrations in various texts and magazines, and home-made apparatus should be used frequently. But it will be impossible for the pupils to make satisfactory progress in this course if some precise and accurate laboratory equipment is not provided.

## Outline of the Course.

### A. Molecular theory of the composition of matter.

- (1) Molecular forces; cohesion, adhesion, surface tension, capillarity.
- (2) Molecular motions explaining phenomena of heat, expansion, gas pressure, diffusion, osmosis.

### B. Heat.

- (1) (a) Nature and sources of heat.
- (b) Expansion of solids, liquids and gases when heated.

- (i) Solids—increased in length and diameter, coefficient of expansion, unequal expansion, practical applications.
  - (ii) Liquids—Coefficient of expansion, practical applications—thermometer, its construction, graduation, Fahrenheit and Centigrade scales. Maximum density of water, natural importance.
  - (iii) Gases—Equal expansion of all gases, Charles' Law.
- (2) Heat transmission :
- (a) Methods—conduction, convection, radiation.
  - (b) Practical applications—heating and ventilation systems in houses, large buildings, mines—hot air, hot water and steam systems.
- (3) Heat measurements: Calorie, B.T.U., Thermal capacity, specific heat, practical applications.
- (4) Change of state :
- (a) Solids to liquids, liquids to solids.
    - (i) Freezing and melting points—effect of pressure and of substances in solution—change of volume.
    - (ii) Heat of fusion—heat required for solution, freezing mixtures, practical applications.
  - (b) Liquids to gases, gases to liquids.
 

Evaporation—conditions affecting rate of evaporation. Heat absorbed, dew point, humidity and vapor pressure.
  - (c) Boiling point—effect of pressure, altitude and substances in solution on boiling point—distillation.
  - (d) Practical applications—cooling by evaporation, artificial cooling, hydrometer.

### C. Wave Motion.

- (1) Energy Transmission—direct contact, conduction, convection, currents, wave motion.
- (2) Wave motion—characteristics, modes of production of waves, transverse and longitudinal waves, wave length, amplitude, frequency, relation between velocity, wave length and frequency. Reflection of waves, standing waves, nodes and loops.
- (3) Energy transmitted by wave motion—sound, light, electricity, *e.g.*, wireless telegraphy and radiophone—Media of transmission.

### D. Sound.

- (1) Production, transmission, velocity, reflection, echo, relation of velocity to medium of transmission.



- (2) Intensity of sound, relation to density of medium, amplitude of vibration, distance of sounding body.  
Consonance and resonance—principle involved in each case.
- (3) Musical tone—characteristics, intensity, pitch, quality and factors upon which each depends.
- (4) Musical instruments—production of musical tone, change of pitch and change of intensity, various stringed and wind instruments, phonograph.

## E. Light.

- (1) (a) Nature of transmission of light—pinhole camera, shadows.  
(b) Intensity of illumination, illuminating power, law of inverse squares, photometry, practical applications.
- (2) Reflection of Light.  
(a) Plane mirrors, laws of reflection, position and characteristics of images in inclined and parallel mirrors.  
(b) Curved mirrors, *e.g.*, convex, concave and parabolic: principal axis, radius of curvature, principal focus, real and virtual images, relative position and magnitude of object and image; practical uses.
- (3) Refraction of Light.  
(a) Nature and cause of refraction; Laws of refraction; Index of refraction; refraction phenomena—plate glass, prisms, lens; total reflection.  
(b) Lenses—concave and convex—principal focus, focal length, power, conjugate foci, images.  
(c) Applications, Luxfer prisms, magnifying glasses, spectacles, camera, projection lantern, microscope.
- (4) Color.  
(a) Production of the spectrum, complementary colors, rainbow.  
(b) Color of objects; mixing of paints.

*N.B.*—The course in light should be mainly experimental drawings representing images with plane and curved mirrors mirrors and lenses being omitted.

## F. Electricity and Magnetism.

- (1) Magnetism.  
(a) Natural and artificial magnets; magnetic substances; polarity, Law of attraction and repulsion; Induction; Field of force, magnetic permeability, shielding.  
(b) Earth's magnetism—Demonstration of Earth's polarity and inductive action; declination and inclination; compass.

(2) Current Electricity.

- (a) Voltaic cell—construction, source of energy, local action, polarization, detection of current; a few common cells, construction, use, methods of preventing polarization and local action.
- (b) Electric units—ampere, volt, ohm; Ohm's law; grouping of cells.

(3) Chemical and Magnetic effects of the electric current.

- (a) Chemical—electrolysis of water, electro-plating.
- (b) Magnetic—
  - (i) Magnetic field about a conductor; electromagnet; function of helix and core; conditions determining strength of electromagnets.
  - (ii) Practical applications of electromagnet—electric bell, telegraph instruments, lifting magnets, galvanometers.

(4) The Induced Current.

Conditions for production of induced currents, direction of induced currents—Lenz' Law; alternating currents; easy illustrations.

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## PHYSICS 2

### Introduction.

The course in Mechanics includes a fairly intensive study of mechanical principles and their application in daily life. The subject is approached from the experimental and observational points of view and will necessitate more laboratory work than is frequently required for courses in Mechanics. The problem work is very important, and is more extensive than in the Science courses of the preceding grades. The course stresses the valuable contribution of applied Mathematics to the development of Physical Science, and enables the student to grasp new possibilities in each through their intimate correlation.

### Outline of Course:

#### A. Measurements:

Units of time, mass, length, area, volume, etc., and methods of measuring these quantities.

#### B. Motion:

- (1) Definition—displacement—velocity—parallelogram of velocities—resolution of displacements.
- (2) Acceleration—uniform acceleration, acceleration due to gravity.

- (3) Momentum—Relation of momentum to mass and velocity—change of momentum—relation to force and time—Newton's Second Law of Motion—transference and conservation of momentum.

### C. Force:

- (1) Gravity and absolute units of force—mass and weight—comparison of masses.
- (2) Inertia—Newton's First Law.
- (3) Action and Reaction—Newton's Third Law.
- (4) Centrifugal and Centripetal forces—practical applications, *e.g.*, centrifuge, Babcock's Milk Tester, Cream Separator.
- (5) Composition and resolution of forces—parallelogram of forces, triangle of forces.
- (6) Moment of a force—resultant of parallel forces—couple—equilibrium of a rigid body.
- (7) Friction—sliding and rolling friction—coefficient of friction—laws of friction.
- (8) Centre of gravity—condition of equilibrium—three states of equilibrium.
- (9) Gravitation—principle of universal gravitation.

### D. Energy:

- (1) Units of energy and power including heat, electrical and mechanical units.
- (2) Law of conservation of energy—transformation of energy and relation of energy and power units, heat, electrical and mechanical.
- (3) Power development and transmission—practical application—water powers and water wheels, turbines, steam engines, steam turbines, gasoline engines, wind mills—transformation to electrical energy, transmission and use of electrical energy.

### E. Machines:

Levers, pulley, wheel and axle, inclined plane, wedge, screw, differential pulley, differential wheel and axle, automobile transmission.

## Mechanics of Fluids.

### A. Pressure of Fluids:

- (1) Pressure of fluids at rest—pressure proportional to depth and specific gravity of liquid—pressure independent of shape of containing vessel—pressure at a point in a liquid equal in all directions—pressure gauge—calculation of pressure on horizontal, vertical, and inclined surfaces.
- (2) Transmission of pressure—pressure transmitted equally and undiminished in all directions and at right angles to surfaces.

- (3) Buoyancy—Archimedes' principle—density and specific gravity, definition of terms and methods of determining specific gravity of solids and liquids.
- (4) Pressure on surfaces of water currents and winds due to their rate of flow.
- (5) Pressure of air—Torricelli's experiment—cistern barometer—aneroid barometer—determination of heights by barometer—buoyancy of gases.

#### **B. Surface Tension:**

Surface tension—laws of capillarity—practical applications.

#### **C. The Flow of Liquids:**

Torricelli's Law—rate of flow of a liquid—energy of a liquid in motion—Bernoulli's principle—Venturi water meter—practical applications—Jet pump, Bunsen's filter pump, atomizer.

- #### **D. Kinetic Theory of Gases** explaining Boyle's Law, Charles' Law, rate of diffusion of gases through porous walls, expansive pressure of gases—calculation of rate of motion of molecules of gases.

#### **E. Machines:**

Construction and operation and principles applied.

Lift pump, force pump, hydraulic press, siphon, Geryk or oil air pump, mercury air pump, condensation vacuum pump, air compressors, air brakes, pneumatic caisson, pneumatic hammer and drill.

















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